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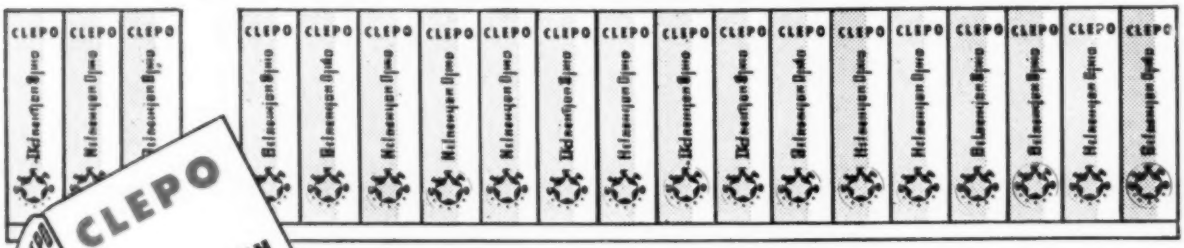

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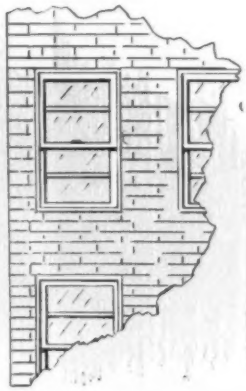

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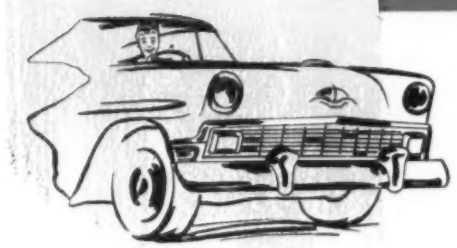

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Journal of the American Electroplaters' Society

March 1958 — **Vol. 45, No. 3**

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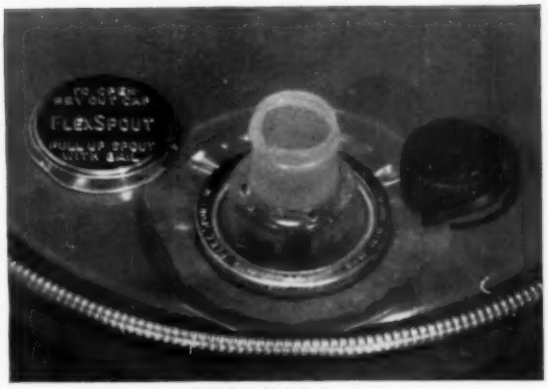

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EDITORIAL

ORGANIC FINISHING—"A GENERAL VIEW"

MUCH HAS been written and much has been said about the use of Organic Coatings, both as finishes in themselves and as supplementary applications to enhance the eye appeal of a product. Too often this information is ignored, or not even known about, by those who do the finishing, and the governing factor is "get the parts out of the shop" regardless of what will happen later on. Lucky is the contract shop that bids on a product where the order is accompanied by a complete set of specifications stating just what material is to be used, and how it is to be applied. It must be remembered that the engineer who designs the part for a specific function has many important questions to consider before arriving at the final specifications.

The base material chosen to make the part or the surface to be coated helps govern the choice of surface preparation. Mechanical preparations such as grinding, sandblasting, grit blasting, shell blasting, or vapor blasting are sometimes used as pre-cleaning treatments followed by the usual alkali, emulsion or vapor degreasing to produce a chemically clean surface. The parts may then be given a conversion coating applicable to the surface and suitable for the specific use. These treatments are listed under numerous trade names but in general they are phosphates, chromates, chromic acid, molybdates, oxides and others—each with characteristics all their own.

Once a part has been prepared for an organic coating, more decisions must be made as to how it will be applied and what type of film should be used. The application may be made by any of the following accepted methods: brushing, dipping, tumbling, flow coating, roller coating, manual air spraying, automatic air spraying, electrostatic spraying, hot spraying, steam spraying or high pressure spraying, and each type will have a great influence on the choice of material to be applied and the solvent to be used. The end use of the finished part must also be considered, such as for use inside or outside, in corrosive elements and for decorative or functional uses. Organic coatings have greatly increased in number from the long-used types such as lacquer, enamel and drying oil mixtures to the innumerable synthetic resins of our plastic age. A few of these are (1) Acrylics, (2) Alkyds, (3) Epoxies, (4) Melamines, (5) Phenolics, (6) Rubber, (7) Silicones, (8) Urea-formaldehydes and (9) Vinyls. Almost every new edition of our trade literature carries the announcement of some new development in the field of synthetic coatings.

From this "General View," it can readily be seen that the choice of organic coatings and their application involves much more than just covering a piece with some film. It has become a science requiring much study and experience if one would use it to the best advantage.

Any one of the points mentioned above could be the subject of an extensive paper, or the evening's topic for a fruitful Branch Meeting. Many speakers are now available and quite a few Branches have taken advantage of this enlarging field of study by scheduling meetings on these subjects. One Branch reported a great increase in membership directly attributable to such meetings. Yours may attain similar result. Try it and see.

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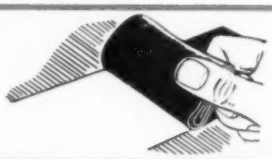

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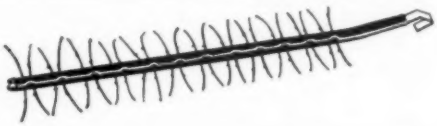

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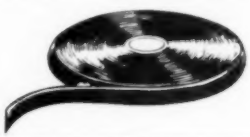

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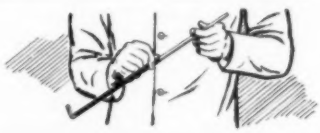

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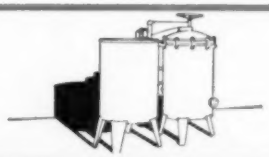

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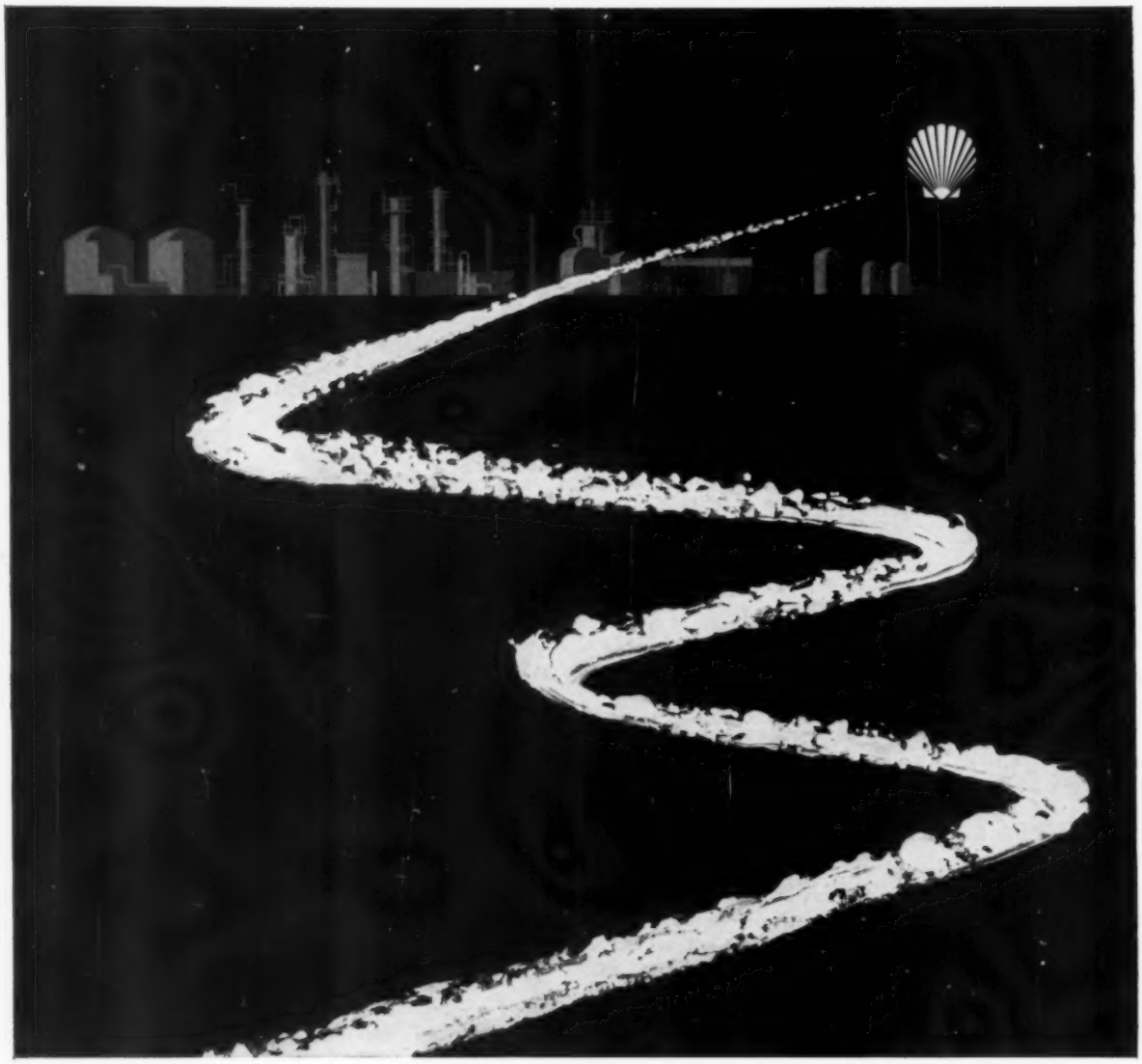

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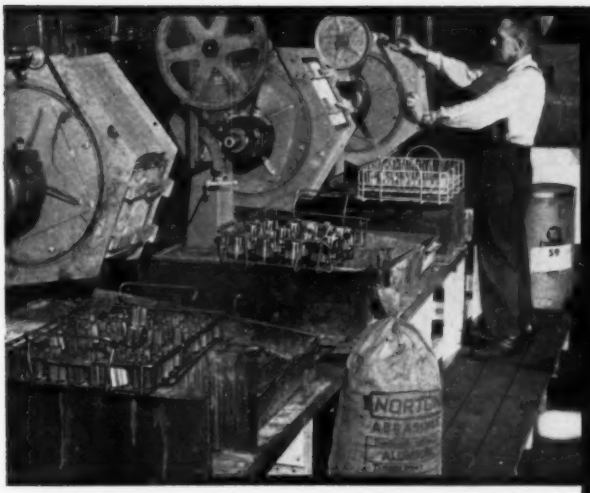

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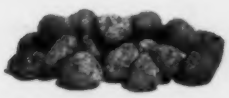

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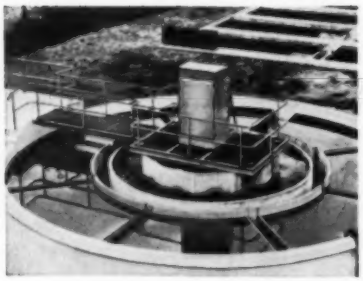

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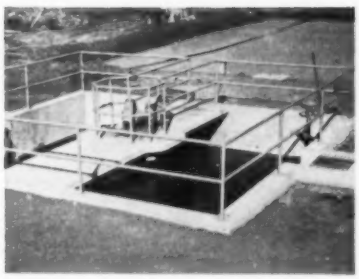

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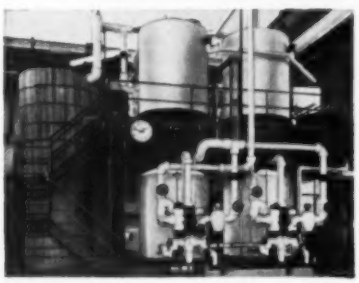

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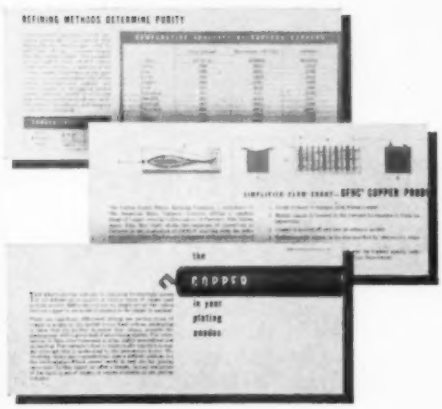

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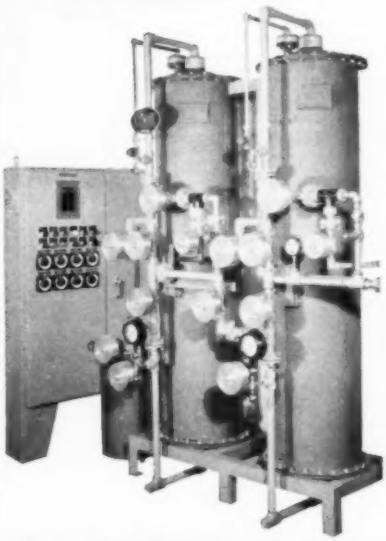


AUTOMATIC DE-IONIZER

New, simplified, pneumatic ILLCO-MATIC valve-operators, designed and built especially for this service, are featured on the two-bed Automatic De-Ionizer shown above. *ILLCO-WAY Two-Bed or Mixed-Bed De-Ionizers, equipped for automatic operation, can be built to any service or cycle your processes require.*

EASILY ADJUSTABLE

The control panel for ILLCO-WAY Automatic De-Ionizers features a set of adjustable Timers, one for each operation. Instant readjustment of the time of any cycle is thus possible, giving the user full flexibility to meet any conditions. Automatic sensing devices can be set to start the regeneration cycle under any specified requirements. *For further details, consult your ILLCO-WAY representative, or write to . . .*

ILLCO-WAY

ILLINOIS WATER TREATMENT CO.
840 Cedar St.
Rockford, Ill.

NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.
CANADIAN DIST.: Pumps & Softeners, Ltd., London, Ont.

INDICATE A 309.

A smooth, flawless finish in this mold plated by Nutmeg Chrome Corp. assures an equally flawless finish in molded melamine dishwear. Nutmeg considers the finish of this force and cavity, hard-plated with Mutual Chromic Acid, "about the highest lustre obtainable on any surface."

For perfect plating every time use Mutual *LOW SULFATE* Chromic Acid

When only a perfect finish will do, the purity of Mutual Chromic Acid is one safeguard against plating difficulties . . . and against expensive rejects!

Mutual Chromic Acid is always 99.75% pure – or better. Sulfate content never exceeds 0.1%. Rigid quality control by Mutual insures that the chromic acid you get is always the same. This makes it easy for you to control accurately the acid-sulfate ratio of your plating bath.

To learn more about these and other advantages of Mutual Chromic Acid, send today for "Chromium Chemicals." This booklet gives full technical information on the entire line of Mutual Products. Mutual's Technical Service Staff will also be happy to offer help and information at any time.

Mutual Chromium Chemicals

MUTUAL

Sodium Bichromate
Sodium Chromate
Chromic Acid

Potassium Bichromate
Potassium Chromate
Ammonium Bichromate

MUTUAL CHROMIUM CHEMICALS
SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.

Allied Chemical

P4-8-1

Please send me Bulletin #52 –
Chromium Chemicals – Their History, Properties and Uses.

NAME_____ POSITION_____

COMPANY_____

STREET_____

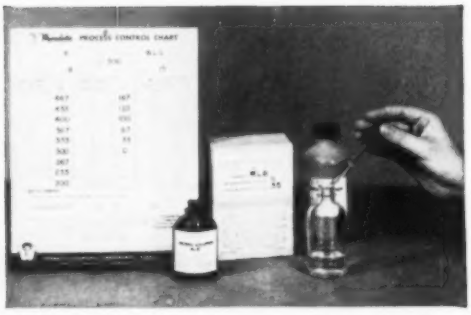
CITY_____ ZONE____ STATE_____

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 310.

1. Technical Service — Factory-trained representatives, quickly available when needed; backed by factory specialists for a prompt solution to your problem . . . and kept up to date on latest metal-finishing practices.

2. Research — Extensive, modern facilities, including: pilot multi-stage spray washer, complete pilot-plating line, nuclear studies for Cleaner Research (in which we have pioneered). All staffed with experts — the best in the industry!

Try Wyandotte's winning combination!



3. Service Aids—Technically correct instruction sheets, control charts, testing equipment furnished without additional charge.

4. Background — Over 50 years' experience in specialized chemicals assures you of the best products, methods.

When you buy from Wyandotte, you not only get the finest in chemical products, but many other extra benefits, as well!

You get Wyandotte's capable technical service, extensive research, helpful service aids, and vast experience in metal finishing — a combination that means better results at lower cost for you. Contact us today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

WHY DON'T YOU, TOO, TRY WYANDOTTE FOR:

• Metal Cleaners • Paint-Preparation Products • Barrel-Finishing Compounds • Paint Removers • Aluminum Specialty Products • Neutralizers • Rust and Scale Removers • Rust Preventatives

Wyandotte CHEMICALS

J. B. FORD DIVISION

THE BEST IN CHEMICAL PRODUCTS FOR METAL FINISHING

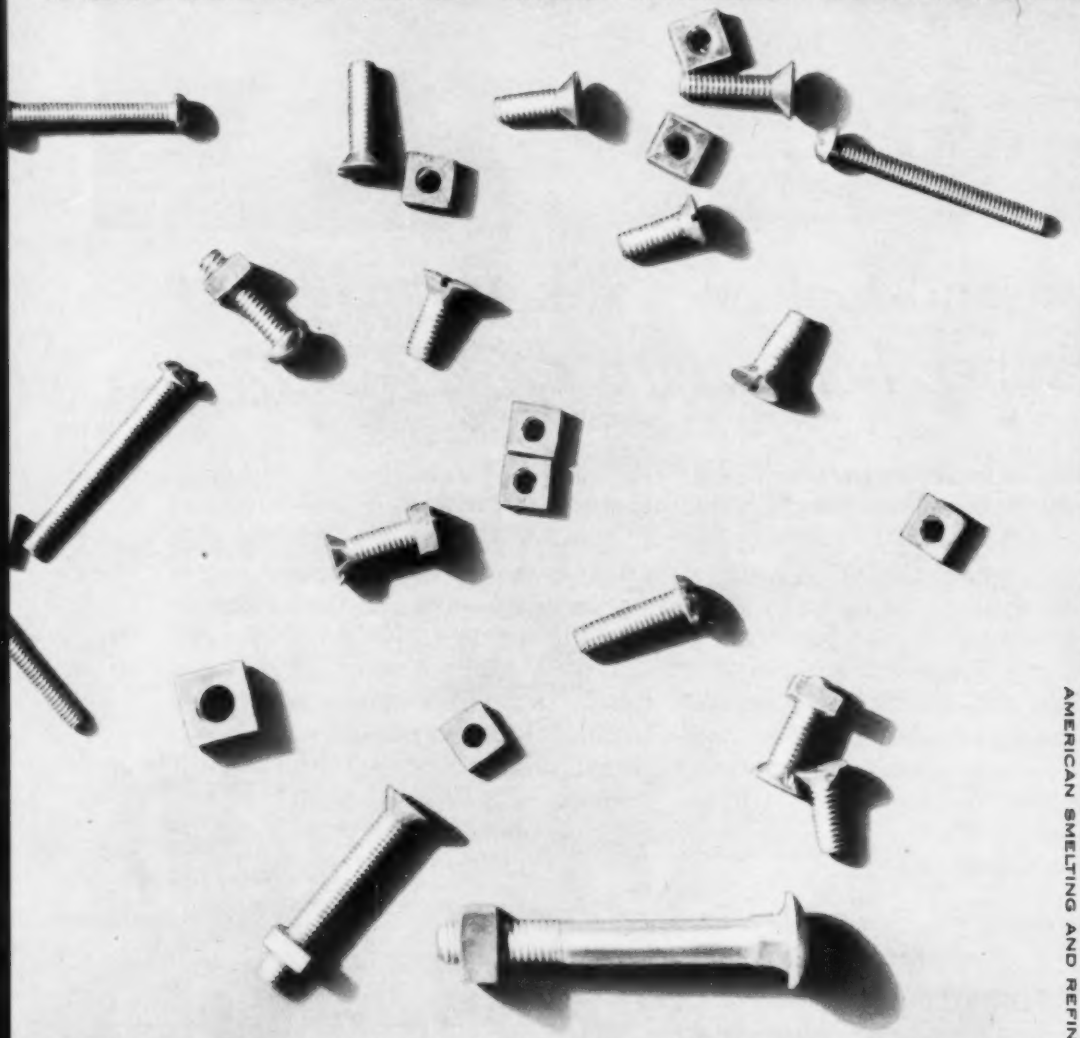
INDICATE A 312. ➤

Your finest work starts with Federated Plating Materials: No Federated plating material is approved for marketing before it has proven its quality through continuing Asarco research. Thus top performance is assured.

This policy of research and testing has rewarded the plating industry with Conducta-Core lead anodes which have greater throwing power, yet last three or four times longer than other lead anodes. Cadmax, addition agent for cadmium plating, is another example of superior materials. So too is Zimax for zinc plating, Nimax, a nickel plating brightener, and new Conmax, a conversion coating for cadmium and zinc plated parts. All do a better job at lower cost.

Your Federated representative or distributor will be glad to document this superiority. And you'll prove it for yourself when you standardize on Federated materials. Federated Metals Division, 120 Broadway, New York 5. In Canada: Federated Metals Canada, Ltd., Toronto and Montreal.

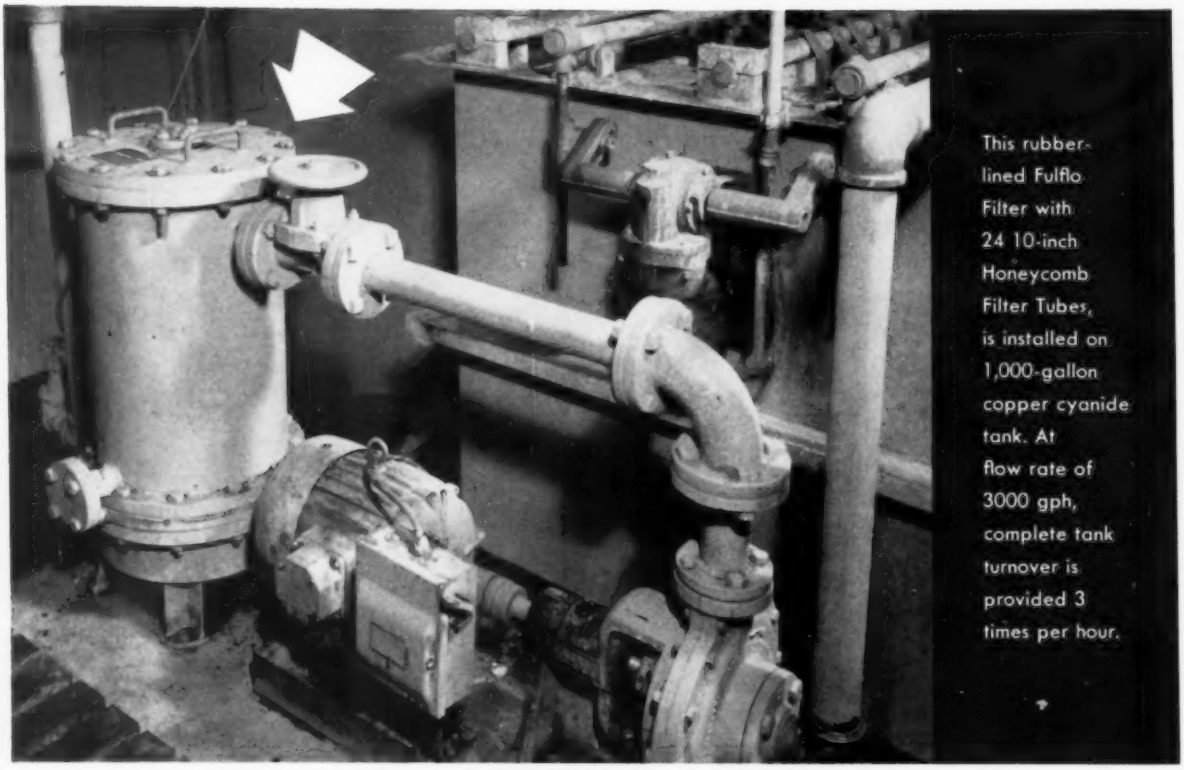
FEDERATED METALS DIVISION OF



ASARCO

AMERICAN SMELTING AND REFINING COMPANY

Federated products for the Plating shop include ANODES: Copper; lead, including the famous Conducta-Core; zinc, tin, tin-lead, cadmium, brass, silver. NICKEL SALTS: Constant quality control assures full nickel content and identical plating characteristics from every lot. PLATING ADDITION AGENTS: Cadmax for still or barrel cyanide cadmium plating; Zimax liquid or powder; Nimax for low cost bright nickel plating; Conmax, a conversion coating, for cadmium and zinc plated parts.



This rubber-lined Fulflo Filter with 24 10-inch Honeycomb Filter Tubes, is installed on 1,000-gallon copper cyanide tank. At flow rate of 3000 gph, complete tank turnover is provided 3 times per hour.

Thousand-Gallon Tank *turned over 3 times per hour with* Fulflo Filters

High tank turnover with Fulflo Filters gives you a harder, firmer plate without costly rejects. You get these results with a small, compact filter that's low in price and requires practically no maintenance.

Tank turnover of 3 times per hour is equivalent to complete tank filtration four times in an eight-hour day. To achieve 5-micron clarity at this high flow rate ordinarily requires filters that are prohibitively large and costly (two or three times the size of Fulflo Filters — and two or three times as expensive).

Fulflo Filters are compact — take as little as 3 square feet of floor space. Low-cost Honeycomb Filter Tubes run for eight weeks or more without attention in the average shop — and are then easily replaced by unskilled labor. In addition, it's seldom necessary to clean the sides and bottom of the tank because of increased agitation and true *depth* filtration. Impurities are trapped in hundreds of diamond-shaped filtering tunnels *inside* the Honeycomb Filter Tubes.

For booklet on the "New Concept of Plating Filtration", write to Department PL.

COMMERCIAL FILTERS CORPORATION
MELROSE 76, MASSACHUSETTS
PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA

MICRO-CLARITY AT MINIMUM COST

Fulflo Filters — *with genuine Honeycomb Filter Tubes for controlled micro-clarity of industrial fluids.*

CFC Filters — *Selective filtration of oils • water-oil separators • magnetic separators • pre-coat filters • coolant clarifiers • automatic tubular conveyors.*

NORTHWEST
LEADS THE WAY WITH CHEMICALS FOR USE WITH
ALUMINUM

If you work with aluminum you'll be interested in Northwest's outstanding line of chemicals for use with modern alloys. Northwest's continuing research and development program has earned them the reputation of "First with the best" in this rapidly developing field. It will pay you to investigate:

REMEMBER!

"Your cost per finished article is the true cost of your cleaner."

- **ALKALUME CLEANERS**—A full line of cleaners and etching compounds especially formulated for use on aluminum alloys prior to plating, anodizing, painting or welding.
- **ALKALUME PRE-PLATE**— An especially effective zincate bath for preparing aluminum for plating.
- **ANOSTRIP**—An easily handled liquid product, excellent for stripping anodic film from aluminum surfaces and racks without damage.
- **ALKALUME DS**— An efficient, economical, 100% active product for removal of etching smut at room temperature.

Northwest products are manufactured on the West Coast by
ALERT SUPPLY COMPANY, Los Angeles

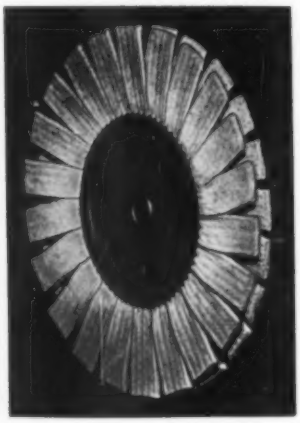
NORTHWEST CHEMICAL CO.
9310 ROSELAWN DETROIT 4, MICH.

L'HOMMEDIEU
Everything for Plating and Polishing

KUL-KUT BUFFS

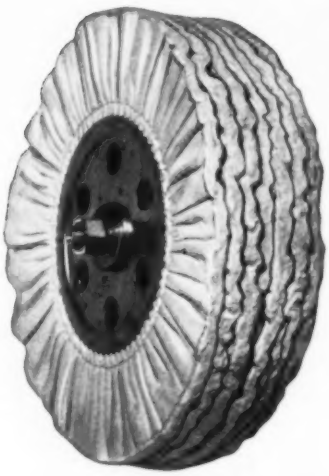
BIAS TYPE • STEEL CENTER • FULLY VENTILATED

Particularly adaptable to semi and full automatic operation



KUL-KUT Segment Buff
(cloth or Sisal)
for polishing
and/or buffing
parts having contoured
surfaces

Longer life—
More parts buffed with
less compound
Fully ventilated and
cooler operating
Pre-tested, accurately
balanced & ready faced
For added safety—one
row of extra heavy
concentric sewing close
to center plate



KUL-KUT Sisal Buff
for cut and color
in one operation
on plain or
stainless
steel

A complete line of air-cooled bias type buffs for every need
Additional information and prices will be supplied on request—a trial will
prove conclusively that KUL-KUT BUFFS are the most economical to use
BUFFING COMPOUNDS EXTRUDED ANY SIZE TO FIT YOUR APPLICATION

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MANUFACTURERS of
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Complete Plating Plants Furnished

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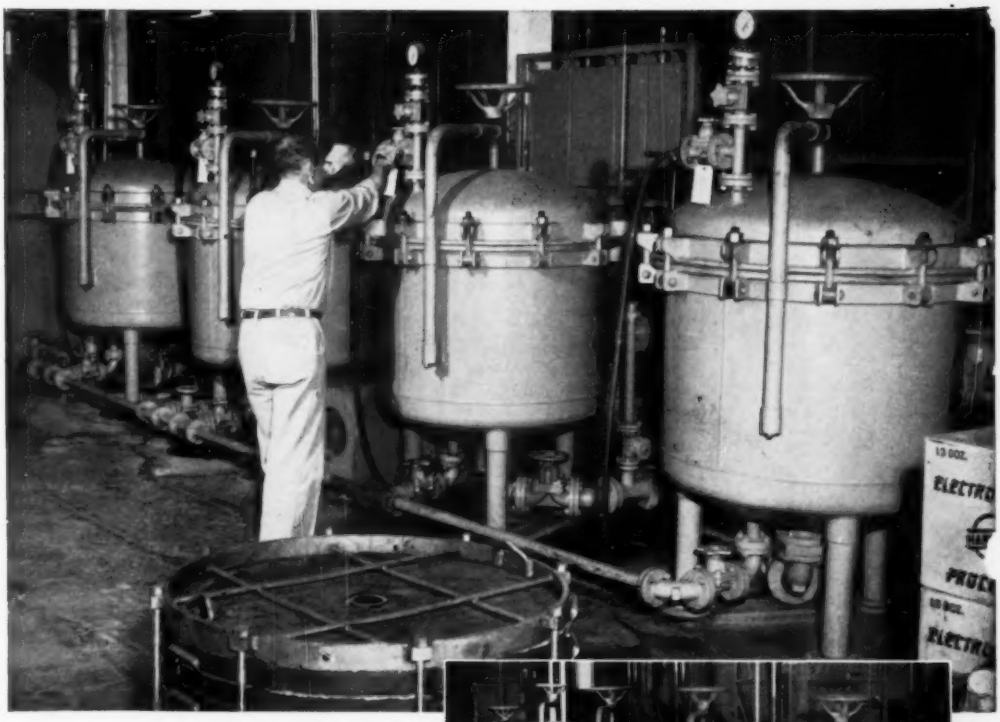
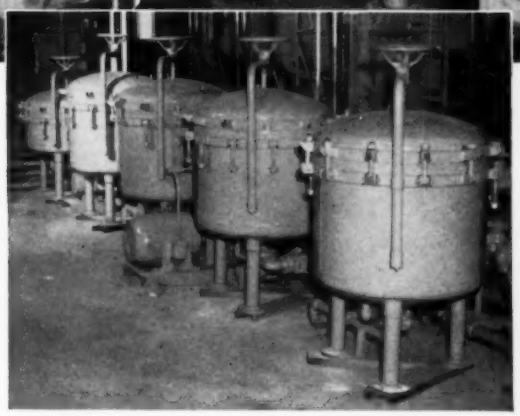




High Flow Rates Low Servicing Cost *give* Low Cost Filtering of Plating Solutions—

2,208,000 gals. of bright nickel solution are filtered in these four Sparkler Horizontal Plate filters (top illust.) through a continuous 5 day cycle with 24 hour operation. Filters are cleaned once a week by lifting out the plate cartridge and replacing it with a fresh dressed set of plates. Only a few minutes is required for this operation.

In the same plating plant, (lower illust.) the four large Sparkler filters are used to filter suspended matter from Ronal bright copper solution. These filters have a flow capacity of 4800 G.P.H. each. The small, far end unit filters suspended matter from a copper strike bath. Capacity 2,100 G.P.H.

On occasion these filters are employed for filtering out activated carbon and lime from copper solution and activated carbon and nickel carbonates from nickel solution.

Plating Plant Engineers will find Sparkler filtration engineers most co-operative to work with on installations of any size.
Write Eric Anderson

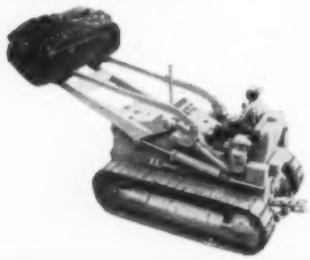
SPARKLER
horizontal plate
FILTERS
(the original horizontal plate filter)

SPARKLER MANUFACTURING CO. MUNDELEIN, ILL.
Sparkler International Ltd.
Manufacturing plants in Canada, Holland, Italy, and Australia.

CrysCoat* first, then paint...

makes products look better longer

CATERPILLAR



Remington Rand

SINGER

SHAW-WALKER

ROYAL

FASCO

More and more plants turning out nationally-advertised products are standardizing on *CrysCoat* for pre-paint surface conditioning of steel.

First off, CrysCoat banishes soils that tend to reduce paint adhesion. At the same time, it creates an integral protective phosphate-coating on the surface that locks paint tightly to metal. Corrosion is blocked before it can even start under the paint film. Rust can't undercut and blister the paint at nicks and scratches.

Any good organic finish becomes even better in appearance and serviceability when applied to a CrysCoated surface.

With four Oakite CrysCoat Processes to choose from, there's bound to be one to match your production set-up and product requirements. Your CrysCoat Man can show you how. Send for Bulletin F8979 and F9475 that give detailed information. Oakite Products, Inc., 400 Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE®

MATERIALS - METHODS - SERVICE

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Export Division Cable Address: Oakite

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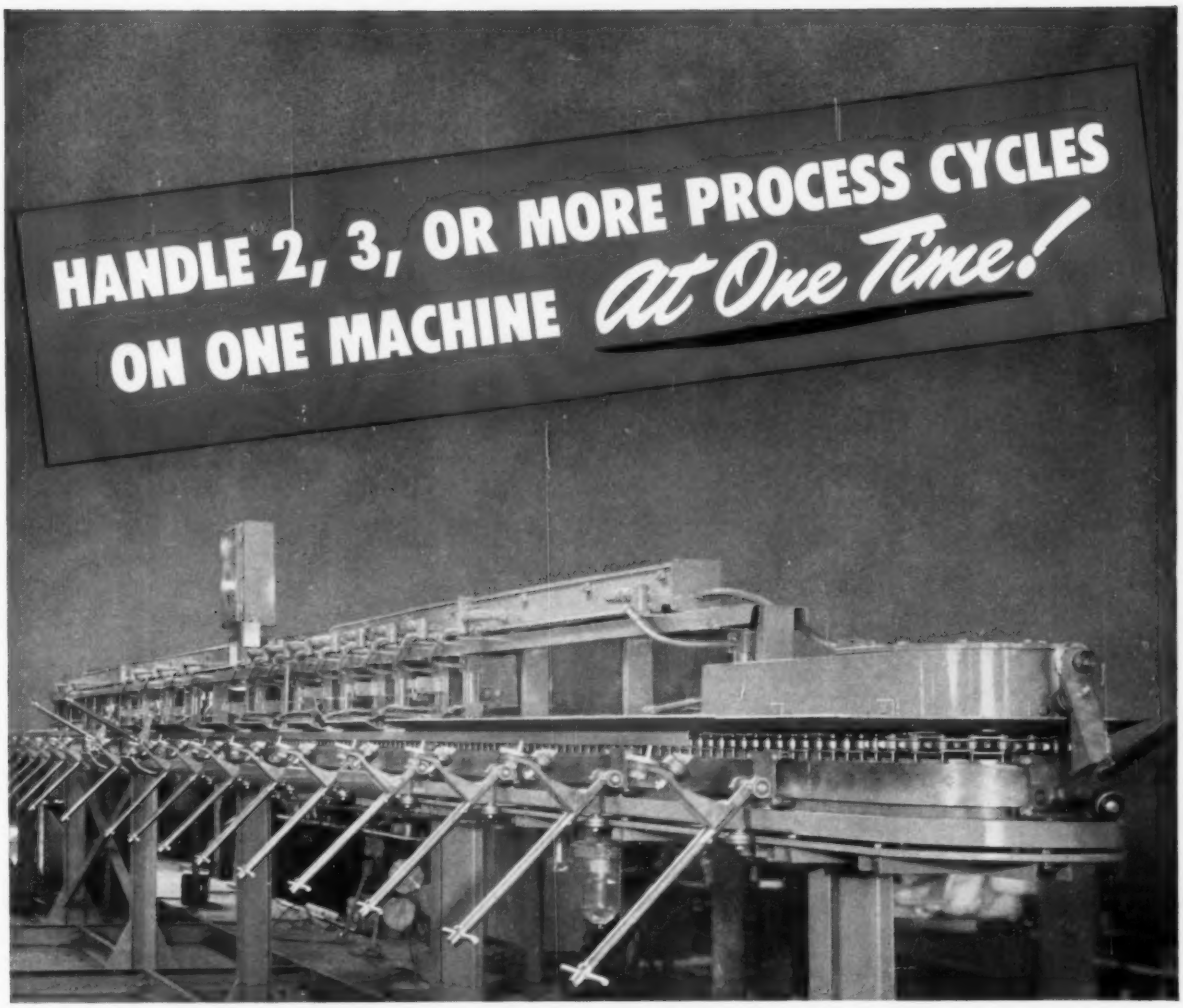
**A complete phosphating process by Oakite*



LASALCO'S *Select-O-Matic*

MULTIPLE PROCESS PLATER

Another Lasalco development that offers the industry the last word in *fully automatic* plating!

With the new Select-O-Matic, the operator simply selects the desired process cycle for individual racks, when loading the machine, merely by turning a dial on the carrier. From that point, the rack *automatically* travels through the entire selected cycle without further attention.

A single Select-O-Matic plater, manned by one operator, will handle several various processes simultaneously. Different machines for each process are eliminated—original investment in equipment is greatly reduced—much less floor space is needed—maintenance is cut to an absolute minimum.

The Select-O-Matic is easily adaptable to any operation. Tell Lasalco about *your* operation and requirements to learn what this new machine can do for *your* production and profits.

Write Today!

LASALCO, INC.

HOME OFFICE: 2820 LaSalle St. • St. Louis 4, Mo. • PRospect 1-2990
IN TEXAS: 2805 Allen Street • Dallas, Texas • Riverside 7-5814

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 318.

(Advertisement)

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER I—Decorative, Corrosion-Resistant Finishing with Iridite

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a decorative finish or a good paint base for non-ferrous metals. However, continued developments are so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can combine salable appearance with durability in one finish at a competitive price advantage. Report II on paint base, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, as a basis for this discussion, a "decorative" finish is considered as any chromate film that is used as a final finish in itself. It may be truly decorative in that its sole purpose is to enhance the beauty of the product. For example, a bright chrome-like finish or a pleasing bronze appearance are among the many effects that can be obtained. It may be functionally decorative in that it reduces reflectivity for camouflage purposes or provides a means of color-coding parts. But, in all cases, the Iridite films protect the metal against corrosive attack.

Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. These films can produce a wide variety of pleasing appearances. The basic colors of the Iridite coatings are grouped below by metals.

ZINC and CADMIUM: Metallic bright, light iridescent, iridescent yellow, bronze, olive drab.

COPPER, BRASS, BRONZE: Metallic bright, yellow.

ALUMINUM ALLOYS: Clear, iridescent yellow, brown.

MAGNESIUM ALLOYS: Light brown, dark brown, black.

SILVER: Metallic bright.

In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

Depending upon the metal and the Iridite used, corrosion resistance of clear and bright films ranges from mild passivity to as high as 500 hours in salt-spray; on heavier dark films, salt-spray resistance ranges from approximately 100 to 1000 hours.

It is this combination of decorative and corrosion resistant properties that accounts for the widening use of Iridite finishes. For example, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, a combination of lustrous chemical polishing of the as-cast surface of zinc die castings and good resistance to corrosion. Further, in many cases, sizeable savings in the cost of buffing and electroplating are realized.

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

On many steel parts, a simple system of zinc or cadmium plate and bright Iridite is used instead of more costly electroplated finishes to provide a bright, decorative and protective finish with tremendous savings in material, equipment and labor.

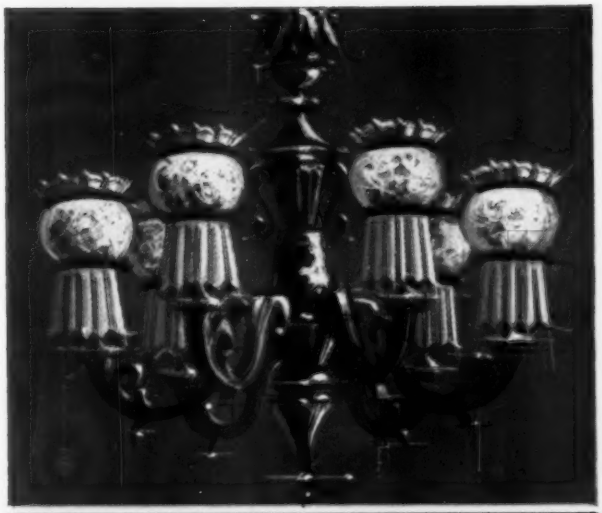
In finishing aluminum, where corrosion resistance or paint adherence is the prime consideration, the aircraft industry has all but abandoned the anodizing process in favor of recently developed chromate conversion coatings, among them Iridite #14 and #14-2 (Al-Coat). These formulations and their method of application can be varied to retain the original metallic appearance while providing acceptable corrosion resistance, or to produce a fully colored brown finish that offers exceptional corrosion protection. Again, time and manpower savings are astounding—one company saved at least $15,000 a year on maintenance of racks alone and another $40,000 on materials and labor in only nine months. In addition, of course, hundreds of thousands of dollars are saved by eliminating the need for expenditures for generators, heating equipment and racks.

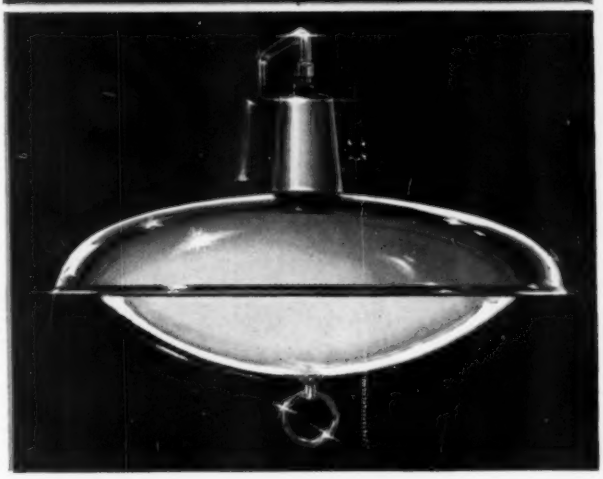
Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to having decorative and protective functions, these chromate coatings form an excellent base for organic finishes and bonding compounds. They have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 E. Monument Street, Baltimore 5, Maryland.

Since the days of the ornate chandelier





A shining, luxurious chandelier was much admired back in 1910. Its lustrous finish added elegance to any room. But that luster caused manufacturers plenty of problems—finishing problems that had to be solved efficiently and economically. For the solutions, manufacturers turned to Acme. And they're still relying on Acme engineers for the answers.

Reduction of costly rejects, increased volume of production, complete machine finishing of odd-shaped pieces . . . these are a few of the solutions Acme engineering has provided.

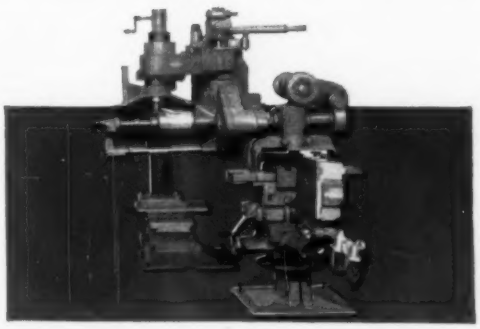
Today Acme progressive engineering builds equipment to polish and buff metal faster—and better, too. And at lower cost, because Acme engineers combine standard units with a wide variety of accessories to make *custom* machines.

Every year of its history, Acme has solved new finishing problems for many industries and manufacturers. Let us help you solve *yours*.

ACME MANUFACTURING COMPANY

1400 E. 9 MILE ROAD, DETROIT 20, MICHIGAN

LEADING PRODUCERS OF AUTOMATIC POLISHING AND BUFFING EQUIPMENT SINCE 1910



Acme special semi-automatic machine with E-10 oscillating fixture arrangement used with Acme G-3 buffing lathe. One operator normally handles two units for most efficient production.

LET ACME *Polish Off* YOUR FINISHING PROBLEMS

neutralize cyanide waste with HTH

Chlorine's ability to convert poisonous cyanide to relatively harmless cyanate . . . plus the convenience of a *dry*, 70% available chlorine product . . . explains the ever-widening use of HTH to treat cyanide waste in the metal processing industry.

With HTH, in either granular or tablet form, you enjoy all the advantages only a dry chlorine product can give. There's no mixing or messing with solutions . . . no handling or storing of carboys . . . no need for trained operators or expensive equipment.

HTH arrives *ready for use*. It's chlorine in *dry* form that can be added directly to waste solutions. It's perfectly safe and simple to store, use, and handle at all times.

Free-flowing, fast-dissolving **HTH Granular.** Packed in 100-lb. drums and in cases of nine 5-lb. cans.

Slow-dissolving **HTH Tablets.** For your protection, every genuine HTH Tablet is stamped H T H. Packed in 100-lb. drums and in cases of twelve 3¼-lb. cans.

If you would like more information on the use of HTH for effective, economical treatment of cyanide waste, write today.

OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

HTH® is a trademark

5596

That's Me!

A Timely Message on **Therapeutic Leisure for Dogs**

(especially German Shepherds)

by Sox von Liebestraum Sax
Ex Detroit Rep. and Assistant to
Ben P. Sax, Chairman of the Board
American Buff Company

All work and no play makes "Sox" a very dull dog, German Shepherd or not. Of course, I don't have as much time for recreation as I used to before I started running American Buff Company single pawed.

For this reason, therapeutic use of leisure time is quite vital to me. And there is nothing that irritates me more than some of the snide tricks humans try to pull on us dogs.

For example, a few years back it was my custom to play chess with American Buffs as chessmen. One day, my father, Stan Sax, our Sales Master, tried to substitute some other buffs. Naturally, I refused to play—anyone knows what *they'll* do to your game. Of course, Stan was only kidding, but it ruined my whole day.

If you're looking for something therapeutic for your buffing problems, your next step is clear. Get in touch with American Buff Company. I'd be delighted to give you "personal" attention.

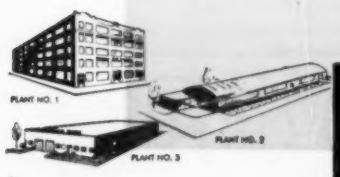
Cordially,

Sox von Liebestraum Sax

"For the Job that's TOUGH...use an AMERICAN BUFF"

World's Largest Manufacturer of Buffs and Polishing Wheels for Every Finishing Operation

Patented Centerless or Permanent Center Construction



American Buff Company

2414 S. LaSalle St., Chicago 16, Illinois • CAlumet 5-1607

AMERICAN BUFFS ARE REGULARLY ADVERTISED IN FORTUNE MAGAZINE

DU PONT PRODUCT NEWS

Don't judge the cost of a cleaning process by solvent or chemical costs alone

Du Pont's new Cost Analysis Service can help you determine total costs . . . the only realistic basis of comparison

It's easy to draw misleading conclusions about the comparative costs of vapor degreasing and wet cleaning by comparing only the cost of trichlorethylene versus alkali chemicals. Such conclusions can result in a costly mistake when choosing a metal-cleaning process. *Invoices tell only part of the story!*

Du Pont has initiated this new cost-analysis service to help you find out what your metal cleaning is now costing, or, in the case of expansion or new installations, to help you determine the most efficient and economical process. Based upon sound accounting principles and 25 years of Du Pont "know-how" in metal cleaning, this service reveals the *total* cost of your operation. All cost factors are considered, including utilities, maintenance and depreciation, labor and the important item of "return on investment."

This Du Pont service can save you real money—in your present operation, or in the consideration of new or replacement equipment. Example: in a plant operating 7 degreasers, over-all cleaning costs appeared out of line. Changes adopted as the result of a Du Pont survey paid off in savings of $3,000 to $6,000 per degreaser.

GET ALL THE FACTS about this informative, cost-saving service. Just ask your local distributor of Triclene® D trichlorethylene, or send us the coupon at right, below.

* * *

DU PONT TECHNICAL MAN points out for visitor how thoroughly grease is removed from metal part suspended in model degreaser. Glass sides of degreaser enabled visitors to see entire process.

Du Pont booth at Metal Show featured Model Degreaser

Visitors to the recent Metal Show in Chicago saw "Triclene" D trichlorethylene in action. They learned how quickly and thoroughly the vapor-degreasing process works and heard about Du Pont's new cost analysis. If you missed the show and are interested in learning more about vapor degreasing and/or Du Pont's Cost Analysis Service, just send us the coupon at right.

How's your supply of "Tri"?

Check your supply of trichlorethylene and be sure you won't be caught short during peak work loads. If you're low, better give your local distributor of "Triclene" D a call. He's well equipped to handle your orders promptly and efficiently.

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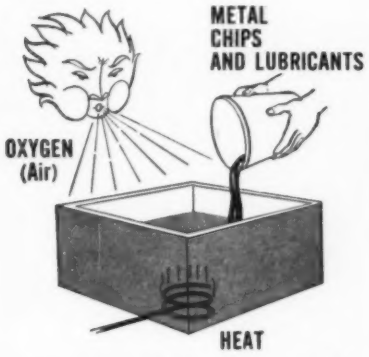
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

FOR MODERN METAL CLEANING



Completely stabilized against breakdown

TRICLENE® D
Trichlorethylene

assures fewer degreaser cleanouts

You can count on brighter, cleaner work and easier, less frequent degreaser cleanouts when you use "Triclene" D.

"Triclene" D contains special stabilizers to protect the solvent against the major deteriorating influences present in modern metal-cleaning operations . . . fatty acids, sulfur-bearing lubricants, oxygen, heat and metal chlorides. These stabilizers, in turn, are backed by a neutral acid acceptor. All of these stabilizers are designed to remain in the solvent indefinitely through distillation after distillation.

The stabilizers in Du Pont "Triclene" D do not combine with fatty acids and other contaminants to form sludge. This is your assurance that your degreaser will maintain peak operating efficiency with fewer, easier cleanouts.

Try Du Pont "Triclene" D and find out for yourself how "full-time" stabilizers make the difference!

New $2 million Du Pont Laboratory will help solve your metal-cleaning problems

In April 1958, the facilities of Du Pont's new Sales Technical Laboratory will provide extra support for the services now offered by your local distributor of "Triclene" D and your Du Pont Technical Representative.

This modern laboratory will have the latest conveyorized production-line vapor-degreasing equipment, including an ultrasonic unit . . . all equipment needed to research problems encountered in both large and small units, hand-operated or mechanized.

Accurate metering devices will make it possible to pinpoint utility costs and to determine solvent losses for all types of production operations. Customers' actual plant conditions can be duplicated and evaluated against norms established at this new laboratory. Actual and theoretical operating costs can be compared.

Ask your Du Pont Technical Representative for further details about this new laboratory—the finest of its kind—soon to be ready to help *you!*

NEW LABORATORY contains 25,000 sq. ft. of floor space and will contain full-scale equipment for demonstration and customer service.

FREE VAPOR-DEGREASING BOOKLET tells you how vapor degreasing works, shows types of equipment, points out many cost-saving advantages. Just mail the coupon below for your copy.

ELECTROCHEMICALS DEPARTMENT
Chlorine Products Division

E. I. DU PONT DE NEMOURS & CO. (INC.)
Wilmington 98, Delaware

☐ Please send more information on your new cost analysis service. P-3
☐ Please send me your booklet on vapor degreasing.
☐ Please have your representative call for an appointment.

*Name*_____ *Position*_____
*Present method of cleaning*_____
*Firm*_____
*Address*_____
*City*_____ *Zone*_____ *State*_____

DU PONT PRODUCT NEWS

Save time, avoid errors in bath make-up and replenishment with Du Pont's new sodium-copper cyanide double salt

Sodium-copper cyanide double salt has been developed by Du Pont to give copper platers a fast-dissolving, tailor-made plating chemical. It's a white, crystalline salt that combines high-quality Du Pont Cyanobrik® Sodium Cyanide and Copper Cyanide into *one* convenient copper-plating chemical for both bath make-up and replenishment.

You'll find these advantages in this new, easy to use sodium-copper cyanide double salt:

Time Saved—This convenient plating chemical eliminates time spent in weighing out sodium cyanide and copper cyanide separately. It dissolves readily in water or plating solution without the evolution of heat . . . cutting out several steps required to dissolve copper cyanide properly.

Errors Avoided—The active ingredients—sodium cyanide and copper cyanide—are present in the proportions required in the bath. This makes preparing or replenishing the plating bath a simple operation.

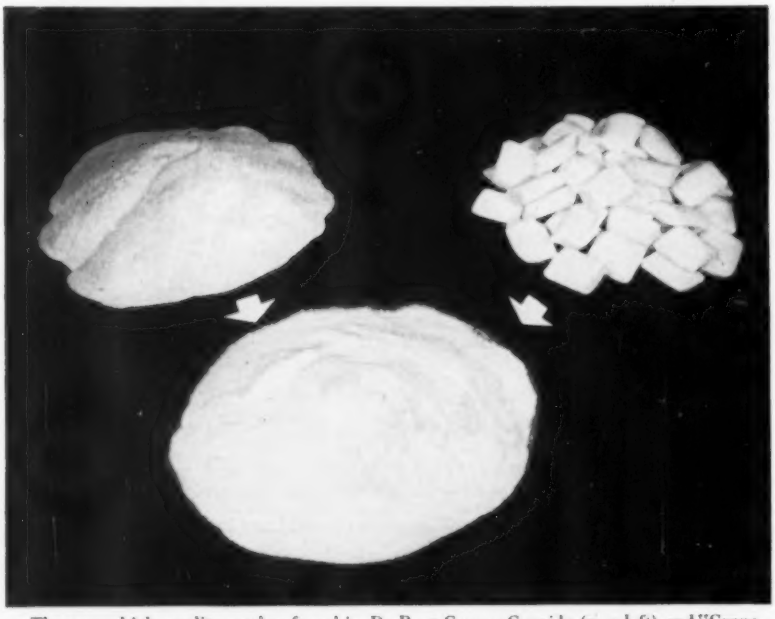
Chemical Handling Reduced—Sodium-copper cyanide double salt's balanced composition cuts down the handling of chemicals giving you an added safety measure.

High Purity—(1) Extremely pure basic constituents, careful manufacturing techniques, and low lead and sulfide contents give you a high-quality product. (2) Double Salt is prepared by crystallization from a filtered solution of Du Pont "Cyanobrik" sodium cyanide and copper cyanide. (3) And new double salt contains no added materials such as sodium sulfocyanide.

Double Salt is shipped in convenient, moisture-resistant 100-lb.-net fiber containers. For more information on this high-quality plating salt, including information on price and delivery, call your Du Pont distributor or write your nearest Du Pont district or sales office.

SPECIFICATIONS	
Copper	28.7% min.
"Free" sodium cyanide	0.4% to 2.0%
Lead	7 ppm. max.
Sulfur as sulfides	10 ppm. max.
Insolubles	0.01% max.

TYPICAL ANALYSIS	
Copper	29%
"Free" sodium cyanide	1%
Lead	Less than 1 ppm.
Sulfides as sulfur	Less than 5 ppm.
Insolubles	0.01%



• The same high quality you've found in Du Pont Copper Cyanide (rear left) and "Cyanobrik" Sodium Cyanide (rear right) is combined into new, timesaving sodium-copper cyanide double salt (foreground).

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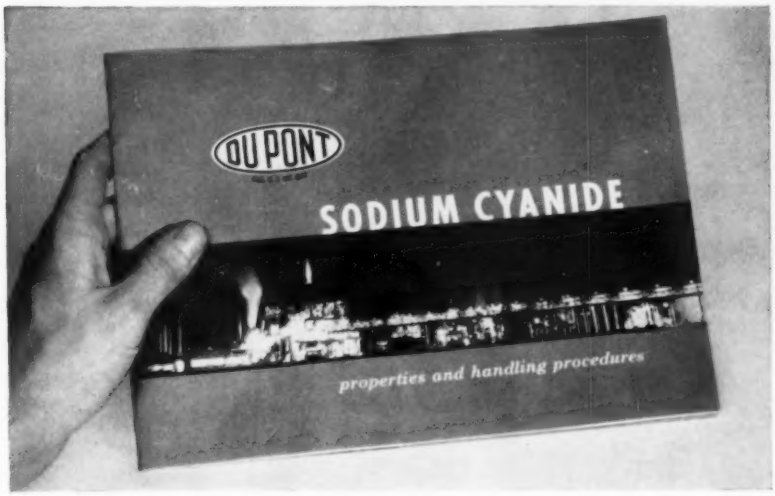
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

FOR MODERN METAL PLATING



New Du Pont booklet gives you valuable information on uses, properties, and safe handling of sodium cyanide

Here's a valuable new reference book on Du Pont Sodium Cyanide. It describes safe handling procedures . . . uses . . . specifications and typical analyses . . . packaging, shipping and storage . . . waste disposal . . . and methods for analyzing sodium cyanide.

Be sure to get your copy of Du Pont's new sodium cyanide booklet. Just write to the Du Pont District Office nearest you.

A new high-speed cyanide copper-plating process

is available from Du Pont for plating steel parts and zinc die castings. Thoroughly field-tested, it's already being used for automobile bumpers and grilles, hardware products and wire. Advantages: low maintenance cost, only two addition agents needed, consistent and easily controlled performance. Contact your nearest Du Pont District Office for full information.

ELECTROCHEMICALS DEPARTMENT
Sodium Products Division

E. I. DU PONT DE NEMOURS & CO. (INC.)
Wilmington 98, Delaware

New Du Pont laboratory nearing completion

designed to help solve your metal-plating problems . . .

This spring the Du Pont Electrochemicals Department's *New* Sales Technical Laboratory will begin providing extra support for the services now offered by your Du Pont distributor and your Du Pont technical representative.

This new lab will be used for the development of new and better plating products and processes. It will contain the latest plating equipment necessary to study and solve problems encountered with both large and small units. In many cases, Du Pont will be able to duplicate actual customer operations. In addition, this installation will house conference rooms and a technical library.

No need to hold off, if you have a plating problem. Get in touch with your Du Pont representative or Du Pont distributor; he'll be glad to help you.

DISTRICT AND SALES OFFICES

BALTIMORE 2,
321 Fallsway
BOSTON 10,
140 Federal St.
CHARLOTTE 1,
427 W. Fourth St.
CHICAGO 30,
7250 N. Cicero Ave., Lincolnwood
CINCINNATI 2,
2412 Carew Tower
CLEVELAND 20,
11900 Shaker Blvd.
KANSAS CITY 20,*
Gulhotte & Mich. Aves.
LOS ANGELES
P. O. Box 70, El Monte
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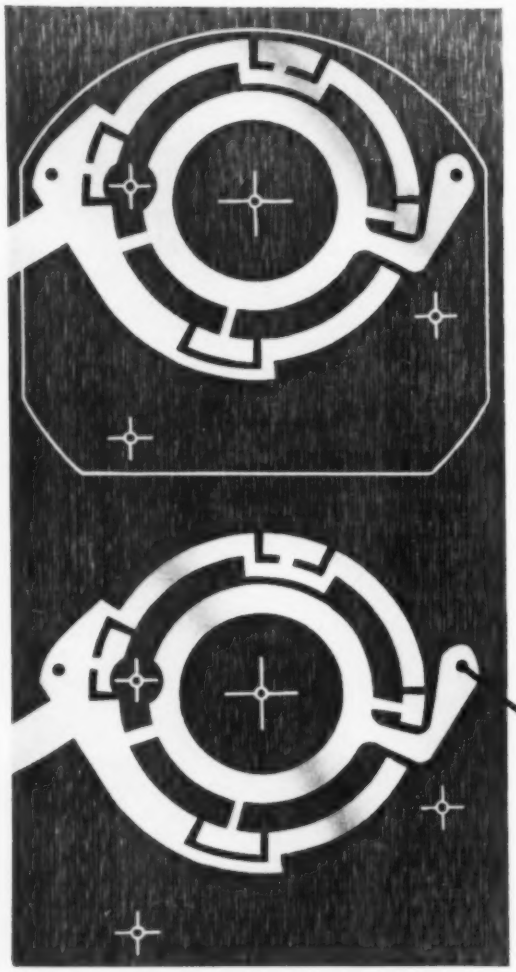
350 Fifth Ave.
PHILADELPHIA
308 E. Lancaster Ave., Wynnewood
SAN FRANCISCO 4,
111 Sutter St.
***Barada & Page, Inc.**
Export Div.
Du Pont Building, Wilmington 98, Del.

Now you can plate THROUGH holes in printed circuits with NEW CuSOL PROCESS



Photomicrographic cross-section of printed circuit shows how the CuSOL process permits plating through holes in core stock.

Plating *through* holes in printed circuits is only one big feature of Seymour's new CuSOL* process. Besides the exceptional throwing power which makes this new, exclusive Seymour process ideal for plating of printed circuits CuSOL has other features which make it unique and useful to copper plating.

CuSOL may be added directly to either Copper Sulphate or Copper Fluoborate baths.

CuSOL permits smoother, more ductile deposits of *any thickness* than is possible with molasses, bone glue or dextrin baths.

CuSOL eliminates "treeing" and nodular build-up.

CuSOL deposits are easy to buff.

CuSOL copper plate is hard (75 on Rockwell F scale).

CuSOL permits use of wide current density range and increases plating speeds from 50% to 200%.

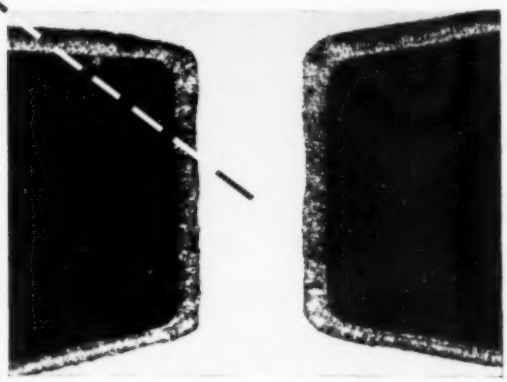
CuSOL is inexpensive to use and economical to maintain.

*** Patent Applied For**

COMPARISON OF PHYSICAL PROPERTIES
CuSOL vs DEXTRIN TYPE BATHS

	CuSOL	DEXTRIN
Tensile Strength	41,000 psi	33,000 psi
Elongation in 2 in.	23%	16%
Rockwell "F" Scale	75	66
Ductility	4 bends on itself	2 bends on itself

(Thickness of copper specimens tested was 0.033")



Write for detailed information

THE SEYMOUR MANUFACTURING CO.

5 FRANKLIN ST., SEYMOUR, CONNECTICUT

NOW!

THE HIGH TEMPERATURE CHROME PLATING ADDITIVE

with DUAL ACTION *

New ZERO-MIST H.T.-2

* *IT STOPS MIST AND SPRAY COMPLETELY*

* *IT LOWERS SURFACE TENSION*

You save money TWO ways with new Zero-Mist H.T.-2! Its DUAL-ACTION absolutely suppresses mist and spray in decorative chrome plating baths of *any type* and at the same time lowers the surface tension. You don't have excessive dragout—You don't lose solution in the air—You don't contaminate other plating solutions—You simplify your ventilation problems . . . *and*, Zero-Mist H.T.-2 maintains its efficiency at any operating temperature.

New Zero-Mist H.T.-2 is extremely economical too! Its DUAL-ACTION means faster make-up . . . and less maintenance and, it's stable *forever*, whether the solution is in use or standing idle.

For the economical, complete suppression of mist and spray in your decorative chrome plating baths . . . with the *biggest* savings in chromic acid solution, see your local Udylite representative today and start using New DUAL-ACTION Zero-Mist H.T.-2 right away.

the udylite corporation

detroit 11, michigan • world's largest plating supplier

Sel-Rex®

Plating Progress

Sel-Rex®

Published by SEL-REX CORPORATION

MARCH, 1958 NUTLEY 10, NEW JERSEY No. 1

New Acid Gold Improves Printed Circuits Plating

The perfection of a new Acid-Type Gold Plating Process (ph 3.5-4.5), is expected to be exciting news to manufacturers and platers of printed circuits. Developed specifically for this exacting application, the process' electrolyte is mildly acidic so that neither the laminate nor the adhesive at the interface of printed circuit boards is affected during plating.

Other advantages offered by the new Sel-Rex Acid Gold Plating Process include: operates at room temperature—no hot solutions to damage even the least expensive paper or micarta printed circuit baseboards; approximately 75% greater resistance to abrasive-wear over conventional Gold Plate; mirror-bright, fine grained, uniformly distributed plate—regardless of thickness; solution is simple to prepare and easy to maintain.

The new process also eliminates the need for a conventional "gold strike," thus avoiding damage to the photo resist on printed circuit boards by exposure to a warm cyanide solution.

A technical paper with complete details on bath preparation and control, equipment required, charts on physical properties, etc., is available free for the asking.

FREE LITERATURE CORNER

Just Off The Press . . .

- ☐ PR-1 • Completely new "Guide" to Plating Rectifiers—20 pages, illustrated
- ☐ RX-2 • Rhodium Electroplating Processes—12 pages, demonstrations & charts
- ☐ IP-3 • High Volume Plating Plant in Small Cabinet—Industro-Pak Plater
- ☐ AC-4 • CuSol Acid Copper Process, tree-free heavy deposits—technical report

Still Available . . .

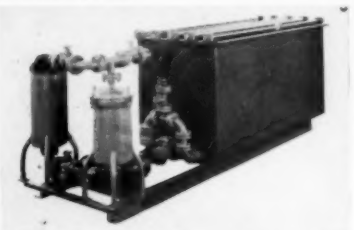
- ☐ BR-a • Gold Plating, Industrial & Decorative, by E. C. Rinker—8 pages, illustrated
- ☐ FD-b • Gold Plating in Electronics by Federal Telephone & Radio—4 pages, illustrated
- ☐ SX-c • Silvrex Bright Silver Plating (Patented)—technical data, 13 pages

NOTE: For your convenience, when requesting the literature you want, simply refer to it by the prefixed code.

Volume Electroplating "Plant" In One Compact Package

Tested and perfected under actual operating conditions by electrical and electronic components manufacturers, the Sel-Rex Industro-Pak Plater was found to permit volume-production in a compact, uncluttered cabinet, while maintaining highest quality plating.

One of the country's leading volume-producers of printed circuits and components installed the Industro-Pak Plater illustrated here, for plating with tin fluoroborate. The unit consists of a 500 gallon steel tank, coated with 3/16" thickness of special vulcanized rubber. A jet orifice manifold at the bottom of the tank provides continuous turbulent flow of the plating solution for smooth, even deposits. Continuous or intermittent filtration is afforded by the built-in filter and slurry tank.



Sel-Rex Industro-Pak Platers are custom-engineered to the specific application, completely bussed with anode and cathode bars in required amperage capacities. Units are available for room temperature plating, or equipped with heating coils.

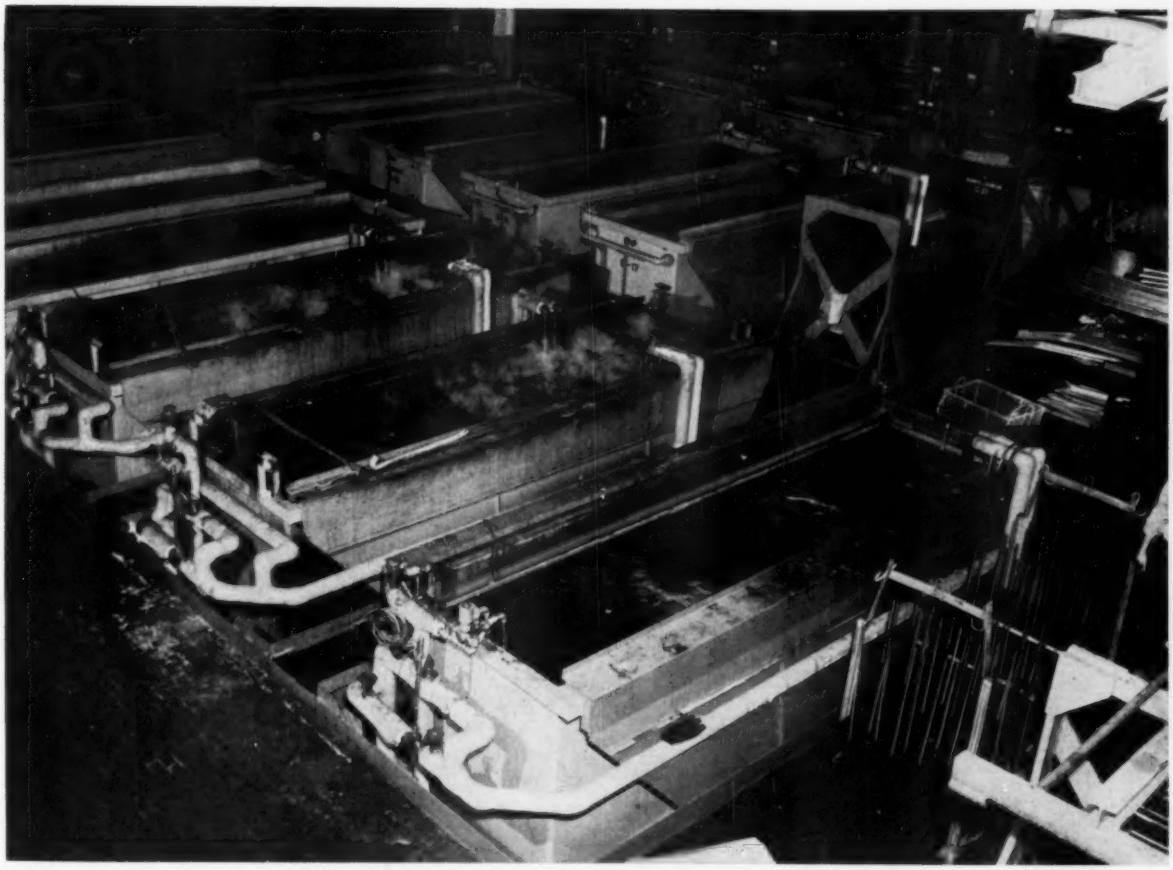
Heavy Copper Deposits Produced At High Speed Are Tree-Free And Highly Ductile

The new CuSol Acid Copper Plating Process* permits faster, smoother, more ductile deposits than any other commercially practical method. Consisting of two simple addition agents, CuSol may be used to convert existing sulphate or fluoroborate copper plating baths, as well as to make up original baths.

Advantages of the new process include: exceptional throwing power permitting evenly-distributed deposits even in "blind" holes and crevices; highly ductile deposits—buffs as easily as Gold; no un-even build-ups or "trees," not even in heavy electroforming — eliminates periodic reverse or "de-plating" methods; and operable in a wide range of current densities—*5 asf to 280 asf*—adjust speed of deposition to conform with your specific requirements.

ATTENTION PRINTED CIRCUIT PLATERS — CuSol's Acid base cannot affect laminate boards, as do cyanide base solutions.

**A patented process of the Seymour Manufacturing Company*



Many of the plating tanks in the Sikorsky plant are plastisol coated to resist a wide range of acid, alkaline and salt solutions. Plating operations include dichromatic surface treatment of magnesium; alodine treatment of aluminum; cadmium, copper and chrome plating; acid pickling; and quenching with nitrate solutions.

ORGANIC FINISHES OVER METAL SURFACES

by MYRON PEREZ*

THE TITLE OF THIS PAPER is so broad discussion will be confined to the principal coating materials used over metal surfaces and in particular the coatings employed over plated metals.

Why are coatings necessary? Ancient man, squatting over his fire and polishing his copper weapons, sought an easier method of keeping the metal bright. He found it in applied coatings crudely compounded from gums exuded from trees. A little later, he discovered that the secretion of the lac bug—shellac—could be used to provide a fast-drying, hard, glossy film. Still later, he mixed basic earth colors with his gum resins to make attractive pigmented coatings. Many of these natural resins and pigments are in use today. And the ancient reasons for using organic finishes still apply: to protect the metal surface and to make the product attractive.

Modern man developed the plating process, again for reasons of beauty of product as well as prevention of corrosion. But with many plated metals, tarnishing remained a problem. Corrosion sometimes actually increased when the plated metal was exposed to moisture. So the need for continued usage of protective organic coatings was very evident, and the demand for improved coating materials became stronger.

In another field, the amazing growth of the chemical process

*Technical Sales, Metal and Thermit Corporation, New York, N.Y.

Carefully checking the thickness of plastisols.

industry rapidly increased the multiplicity of corrosion problems involving both equipment and plant structures. Again came the demand for better coatings, more easily applied, having longer service life.

Packaging of petrochemicals, food products, dye concentrates and other chemicals in steel shipping containers brought about a need for linings. These linings must resist chemical attack upon the metal of the container and also must prevent contamination of the product being shipped. Organic coatings, economical to apply and tailored to meet many individual requirements, have become well-established in this growing field.

The automotive and aviation industries have many problems which can be solved only by using combinations of metal alloys or plated metals plus organic coatings. The aviation industry must contend with the effect of terrific speeds, extremes of temperature, vibration, thermal shock upon metals and coated metal surfaces. Automotive engineers have similar conditions to offset, differing essentially only in degree of severity. In addition, the automobile industry must produce a product whose original beauty of finish will withstand the neglect and abuse of its owner as well as the ravages of time and weather.

In view of these varied and complex situations, coupled with present-day insistence upon obtaining today's answers yesterday, it seems almost miraculous that our coating formulators are only slightly mad. But metallurgists, platers and coating technologists have combined their knowledge and experience to combat the most severe conditions with a high degree of success.

What is an organic coating and how is it developed? Very simply defined, an organic coating is a plastic film deposited from a compound consisting of a film-forming ingredient, usually a resin, dissolved in a volatile solvent. To these basic components we add as required: driers, plasticizers, stabilizers, and pigments or dyes. We normally think of an organic coating in terms of the familiar paint product or solution type coating. Other types which have more specialized end uses or properties are the dispersions and the emulsions. These contain little volatile solvent in the usual sense of the term. Some dispersions contain no solvent whatever.

There are three general methods by which resins change from the liquid to the solid state:

1. Solvent evaporation
2. Oxidation
3. Polymerization

Lacquers and vinyl solution coatings are among the materials which dry by solvent evaporation and leave a continuous protective film upon the coated surface. These coatings will air-dry but evaporation of the solvent and consequent cure of the film may be hastened by force-drying. The drying action in any case is a physical process.

Coatings which dry by oxidation undergo a process of absorbing oxygen from the air. This in turn links the molecules of the film-forming material in a polymerized structure. Many alkyd resins, drying oils, and oleoresinous materials dry by oxidation.

Polymerization usually is considered to be the change of a coating material from the liquid to the solid state under exposure to the heat of baking. This again is a change in the chemical structure of the film-former. Heat-reactive resins such as phenolic or urea-melamine-formaldehyde are converted in this manner by baking in ovens at 300 to 400F. These materials, known as thermosetting coatings, do not resoften under further heating, and become insoluble in the solvents used in formulating them. Coatings which dry by oxidation or evaporation of solvent are called non-convertible or thermoplastic. Their films remain soluble in their original solvents.

The performance and the end usage of an organic coating, then, depend very much upon the choice of resins and their manner of depositing a dried film.

Past procedure brought into prominence a fairly limited

number of resins upon which was based the more successful organic coatings for metals. These are the resins: alkyd, urea, melamine, phenolic, vinyl, acrylic. It should be remembered that although these resins have enjoyed general usage over the broad field of industrial applications, they also have specialized uses in the electroplating industry.

Clear coatings based upon these resins or combinations of the resins have been of primary interest to the plater. Clear coatings have long been used to supplement or complement plated finishes. The application of clear lacquers or synethetic enamels over silver, brass, or copper is nothing new. There is a substantial background of experience in formulating and applying clears to protect lock hardware, metal name plates, structural bronze, refrigerator shelves, zinc plated ice skates, and more recently, chromium plated automobile trim.

This experience showed that a number of the old familiar materials would still provide excellent service in spite of advanced technology which made available a greater variety of newer synthetic resins. For example, during the Korean action when nickel was highly restricted, it was found that it was possible to protect copper-chromium plate or chromium plated directly on steel, by using an overcoat of acrylic, alkyd urea-formaldehyde, or alkyd-melamine based clears. These coatings combined the best available properties for that particular job.

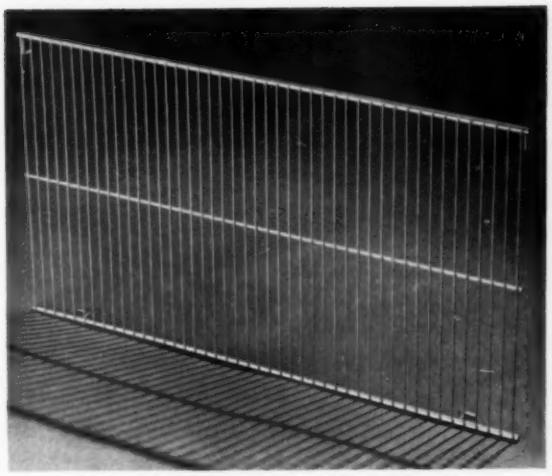
Experience showed something else. It must be admitted that the best organic coating is absolutely worthless unless it can be made to stick to the plated surface. Adhesion and retention of adhesion under test conditions and in use are prime requisites. The factors that influence adhesion may be grouped into two broad classifications: physical and chemical. Physical factors include surface treatment, smoothness or roughness of the metal surface, and wetting characteristics of the coating. Chemical factors are the polar groupings of the film-forming resins. The polarity of the blend of resins used in the coating and the wetting characteristics of the blend can be controlled by the formulator.

The physical properties of a coating can be affected considerably by the properties of its solvent blend. Smoothness, freedom from blisters or stresses, flow, leveling, gloss are characteristics influenced by solvents. The solvent blend selected must have good solvency for the resin, proper evaporation rate, compatibility with the pigment and plasticizer, combined with a cost low enough to keep the finished coating formulation in a competitive and economical price range.

Many resins when deposited as films from solutions produce coatings that are hard and tough but lacking in flexibility and adhesion. To obtain these latter qualities, plasticizing materials are added to the formulation. Three general types of plasticizers are used:

1. Vegetable oils
2. Chemicals
3. Resinous materials

Linseed and cottonseed oils are typical of the first classification. The second type includes a wide range of chemically stable materials having high boiling points or low vapor pressures, for example, fatty acid esters. Among the resinous plasticizers are the alkyd-type resins. Chemical plasticizers are volatile, especially at elevated temperatures; the other types are essentially non-volatile. The type and proportion of plasticizer used in a coating are dictated by the intended application of the coating. It must be remembered that



After plating, this refrigerator shelf was dipcoated with a clear baking synthetic enamel.

plasticizers in general are more sensitive than the basic coating resins to the action of water, acids, alkalies, solvents, and oils. Accordingly, a plasticized coating, while it may be superior in flexibility, can have a lower degree of chemical resistance. The list of desirable properties for plasticizers is too long to review here. It should be noted, however, that careful selection of plasticizers, because of their great number and the variety of properties they offer, can result in building into a coating an equivalent variety of characteristics. Quite obviously, there are limits to the properties that can be built into any one formulation. The state has not yet been reached where the "universal" coating can be produced that will solve all problems.

SPECIFIC PROPERTIES

Of course, the coating is expected to have a number of specific properties. Among these are water whiteness or clarity in a clear coating, good color retention in either clear or pigmented material, good weathering stability, humidity resistance, abrasion resistance, combined with resistance to perspiration or to particular chemical conditions. Stated in simple terms, if these features are demanded, one must begin by selecting resins having some degree of inertness. Unfortunately, such film-forming resins generally have low specific adhesion and low wetting characteristics. The more inert the resin, the poorer these characteristics become.

Our comments on clear coatings are pertinent also to pigmented materials in general. Adhesion of a pigmented coating, as well as some of the other properties of the film, can be influenced by choice of pigment and by the proportional relationship of pigment to resin. Thus the formulator again has a certain amount of latitude in making up the coating, and can exert control over the ultimate characteristics of the dried film.

So much for background information. A basic knowledge of the makeup of organic coatings is important to finishers of metals. But the details of combining the ingredients to meet a set of conditions belong, very properly, in the province of the formulator. What, then, can the organic finisher do to make his finished product better? Assume that the best coating for our work has been selected; it also may safely be assumed that it is based upon a good inert resin. We must

After joints in ductwork are patched for extra protection, ductwork is sprayed with plastisols.

therefore pay particular attention to the condition of the surface to be coated. Smoothness of surface is especially desirable in plated work. Surface pretreatment accordingly must be undertaken if adequate coating adhesion is to be obtained.

To illustrate the effectiveness of careful surface pretreatment, we can use the example of organic coatings applied to chromium plate. Chromium plate is a most difficult surface upon which to obtain adhesion. Yet organic coatings are widely used over chromium, on refrigerator shelving and other wire forms, on name plates, and so forth. Good adhesion has been obtained on chromium without any special treatment, but as a rule only when the organic coating was applied immediately after plating. Even under these conditions results can be very erratic. The coating seldom has good adhesion if the plate has been aged.

Consistently good adhesion can be obtained if the plated work is immersed in a weak solution of chromic acid and then dried quickly without rinsing. If a final rinse is used, it should be deionized water. The treated plate should be dried as quickly as possible and coated with minimum delay. Handling of the work after treatment should be avoided because poor adhesion can result.

Organic coatings generally provide better adhesion and better resistance when they are applied to slightly acid surfaces. Accordingly, if alkaline cleaners are employed prior to coating the work, it should be made certain that the *p*H of the final rinse is below 7. In the plating process itself may be found the causes for poor adhesion of organic coatings. For example: zinc plate with chromate conversion coating normally is treated by leaching to produce brightness before the clear organic coating is applied. The higher the alkalinity of the leaching treatment, the poorer will be the adhesion and resistance of the enamel.

Present practice in coating metal surfaces makes use of the resins referred to earlier and employs the best available methods of cleaning and pretreatment. One new resin, however, has been of considerable interest to both formulators and users of coatings. This is, of course, the epoxy resin. Coatings based upon epoxy resins have excellent chemical and solvent resistance. Because of their flexibility and impact resistance, they have become strong contenders for the place long held by phenolics in the container lining field. Epoxies are widely used in appliance finishing, on wire shelving, on a variety of metal novelties.

There is fairly general agreement that basic coating formulations in the epoxy group consist of the following five:

1. *Epoxy esters:* used as light duty maintenance coatings.
2. *Epoxy amines:* best air-drying solvent resistant coatings in the group.
3. *Epoxy polyamides:* best heavy duty air-drying multipurpose coatings, with good chemical resistance.
4. *Epoxy ureas:* Chemical resistant baking materials, excellent for appliances.
5. *Epoxy phenolics:* high bake coatings having the high degree of chemical resistance required of tank linings.

The epoxy amine is the most commonly-used two-package catalyzed type. One package contains the resin, the other contains the amine curing agent. Mixing of the two is done just prior to use. The pot life of the mixture usually is brief and only enough material should be prepared to use completely within the life period. Applied films of this coating will air-dry in 2 to 6 hours and attain final cure in one week at room temperature. Complete curing can be done in a few minutes at 200F. The cured coating is adherent, hard, durable and glossy.

Epoxy-phenolics, single package baking materials, combine the best characteristics of the two resins. Baking at temperatures above 400F is required to obtain best results. Clear formulations tend to have poor color because of the phenolic resin, but epoxy-phenolic clears are used extensively for coating brass products such as costume jewelry, compacts, pen barrels. Pigmented epoxy-phenolics are most used in lining steel pails and drums and in heavy-duty tank or tank car lining work.

Air drying catalyzed epoxies are of interest as maintenance coatings. Combined with other materials such as mastics, they build up thick barrier films. Pigmented selectively, they are used in multiple coat systems for severe exposure to a variety of chemicals. One typical system consists of:

First coat: epoxy pigmented with zinc dust.

Intermediate coats: epoxy pigmented with red lead or iron oxide.

Color coats: epoxy pigmented with titanium dioxide and desired tints.

There has been a consistent demand among metal finishers for transparent colored coatings—tinted clears used to pro-

duce brass, gold, or copper effects over plated or polished metals. Originally, these coatings were prepared by incorporating small amounts of dye in air-drying nitrocellulose formulations. The resulting tints were brilliant and had good depth and lustre, but the dyes had at best only a reasonable amount of light stability. Today's formulations are permanent light fast tints, most often made up with the baking synthetic resins that have been discussed. For the convenience of the user, these coatings can be supplied in two packages consisting of clear vehicle and color concentrate. The metal finisher makes up his own specific color tint by mixing the two in accordance with a simple color formula. Done on a relatively small-scale basis, this procedure eliminates inconsistencies in tint strength difficult to avoid when color matching large production batches.

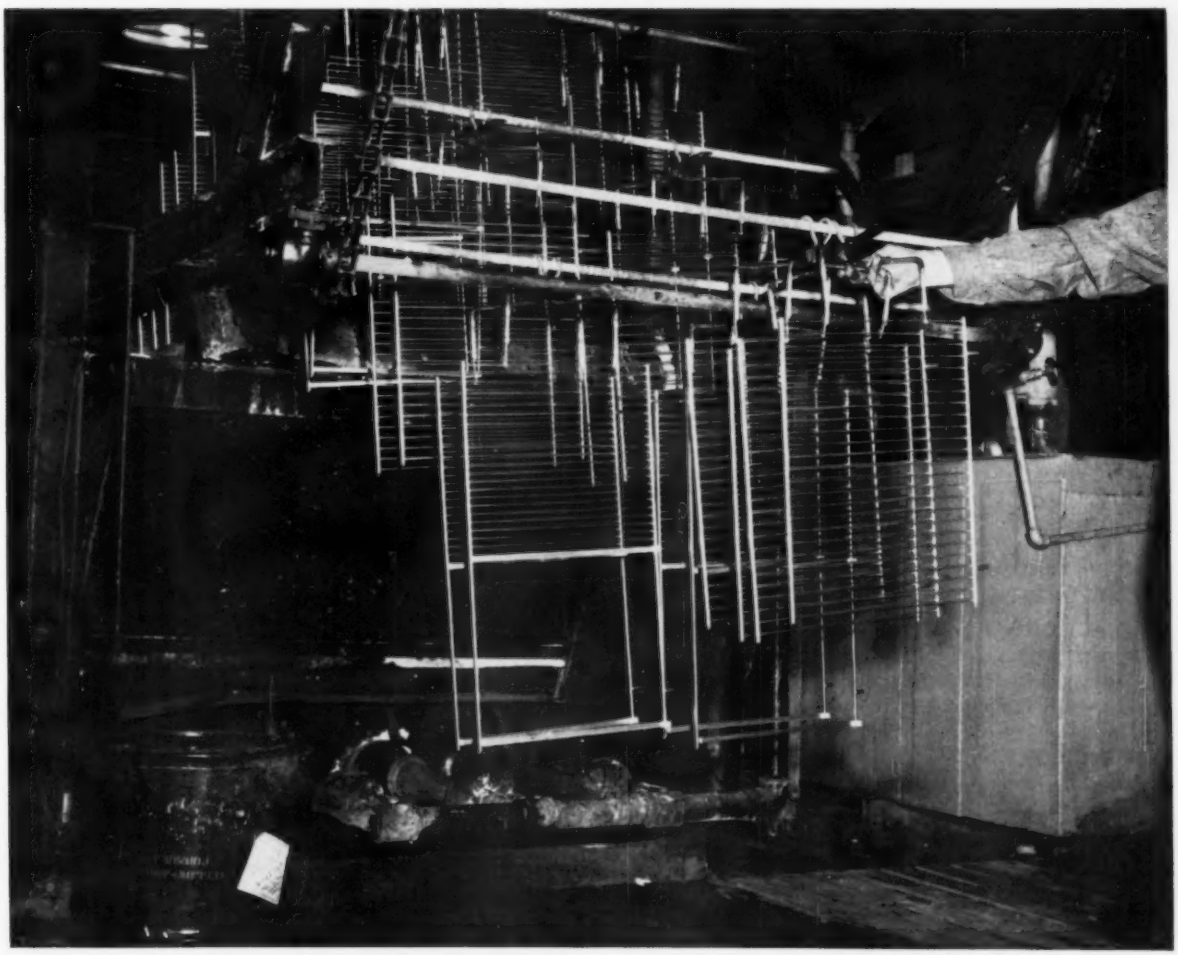
In addition to simulating metal colors, tints and shades of blue, green or red can be produced in endless variety. To obtain the desired effect, any tint must be applied over a bright metal surface. Among suitable metals are nickel, bright chromium, bright clear dipped zinc, polished stainless steel and polished aluminum. In order to obtain consistently uniform color, the brightness and color of the basis metal must be the same on each piece of work. The application of the tinted enamel must be equally uniform. Variations in applied film thickness will cause equivalent variations in color intensity. Over baking will cause darkening of some resins with resulting deepening of the tint. Obviously, careful inspection practices are required.

What about the future? Having no crystal ball handy, let us look at the past again to draw from it some indication of what could take place. The importance of the resins already discussed should be stressed once more, since the greater portion of the coatings formulated in the near future, at least, will be based upon them.

RESINS IN INDUSTRIAL FINISHES

Industrial finishes in general are based upon these resins: alkyd, urea, melamine, phenolic, vinyl, acrylic and epoxy.

Alkyd resins are very widely used and normally are fortified with urea or melamine resins to enhance speed of cure, hardness, resistance to humidity, particularly in baking finishes. In pigmented finishes they have excellent outdoor durability as exemplified by their use as automobile enamels. Their use as white appliance finishes indicates their excellent color re-



Loading a leaching machine to produce brightness on the work prior to clear organic coating.

tention. Clear alkyd or alkyd urea enamels have good water whiteness, hardness and humidity resistance. They are not suitable for applications such as brass or bronze hardware where a high degree of perspiration resistance is required.

Phenolics have excellent chemical and solvent resistance but relatively poor color. In clear formulations their use is generally limited to the darker metals such as brass or bronze. On these metals their perspiration and sulfide resistance is outstanding. Phenolics also are notable for their employment in great volume in container lining work.

Vinyls are highly rated for resistance to humidity, corrosion and chemicals. They are used as can linings for beer, other beverages, and detergents over phenolic, epoxy or oleoresinous primers. They have wide acceptance in the industrial maintenance field. When pigmented they have good outdoor durability, but in clear films they tend to decompose on exterior exposure. One of the original clear coatings for plated refrigerator shelving was based on vinyl chloride resins and was selected because of its good resistance to humidity and abrasion.

Acrylics are outstanding for their water whiteness in clear films and their retention of color and clarity on outdoor exposure. They have good humidity resistance but lack perspiration resistance. When unpigmented they do not have a high degree of hardness or mar resistance. Recent developments point to a large new field of usage for pigmented films as brilliant, long-lasting finishes on automobiles.

Epoxy resins have excellent chemical and solvent resistance. Because of their flexibility and impact resistance, they have become strong contenders for the place held by phenolics in the container lining field. They are widely used as primers for alkyds in the appliance field to enhance corrosion, humidity and soap resistance. Clear epoxies may displace phenolics and vinyls as coatings for refrigerator shelving. Higher baking temperatures than normally employed with other types of finishes are required to develop the full properties of the epoxies. They show considerable promise in all fields of decorative protective clears for polished or bright plated metal surfaces.

In the maintenance coating field the trend is toward using materials that can be applied in fewer coats with heavier deposit per coat, over ill-prepared surfaces. Complex coating systems are yielding place to a single material used over a prime coat, or to multiple coats of self priming materials. Vinyl-based coatings are available which contain so little active solvent that they can safely be applied over old paint without softening or lifting the underlying coating.

Plastisols and organosols—cannot be neglected completely in any presentation of organic finishes for metals. It is safe to say that today vinyl dispersions are used to coat everything from tacks to tanks, from tools to tumbling barrels—and the number and variety of applications for these materials in the future seems unlimited. Many users of plastisols today are indebted to the plating industry, whose members were among the first to realize the usefulness of these thick, resilient films, and promoted their adaptation to other processes.

Very recently, textured vinyl dispersions, spray applied in films 8 to 15 mils thick, have entered the product finishing field, competing with baked synthetic enamels and wrinkle finishes. These new textured coatings have the feel and appearance of leather or laminates, and are available in an unrestricted range of colors.

SUMMARY

If existing practices are used as a basis of judgment, it can be predicted that the future will bring expanded usage of:

1. *Epoxies* in
   a. Clear and pigmented baking coatings for linings, product finishes.
   b. Air-drying or force-drying coatings for maintenance.
   c. Air-drying coatings modified to produce thick films for heavy maintenance.
2. *Phenolics* in
   Pigmented and clear baking coatings for product finishes, process equipment, chemical resistant linings.
3. *Acrylics* in
   a. Air-drying or force-drying clears over plated metals.
   b. Fast-drying pigmented automobile finishes.

Note: Any of these coatings can be produced in transparent colors.

4. *Vinyl dispersion coatings*
   Serious contenders for position in almost any application, decorative or protective, except those requiring resistance to active solvents.

The steady progress of metal finishing technology has been, from the beginnings of the industry, the result of cooperation between the worker in metals and the organic coatings researcher. The plater's part in this cooperative effort has not been a small one.

Myron Perez ("Mike" to those who know him) was born in Brooklyn, N. Y. and has been a resident of Garden City, N. Y. for 34 years. He studied mechanical engineering at Polytechnic Institute of Brooklyn. After two years at sea in U. S. Merchant Service, Engineering Division, he became interested in metal finishing and corrosion problems. Mr. Perez joined Sperry Gyroscope Co. and was in charge of Research Division paint finishing from 1940 to 1946. He worked with Egyptian Lacquer Manufacturing Co.'s technical service group from 1946 to 1948 when he joined United Chromium, Inc., as a member of its Organic Coatings Technical Service. He is now doing technical sales and sales promotion with Metal & Thermit Corporation.

FLAME-SPRAYING PLASTISOLS

by ROBERT F. McTAGUE*

IN ANY INDUSTRIAL CONCERN the ultimate value of research is customarily measured by the monetary return that accrues from that research. When the research team comes up with "No" for an answer, or "It isn't feasible at the present time," we sometimes overlook the valuable lessons learned. Answers to related perplexing problems are solved by association of technical experiences and results. Such is the case with flame-spraying plastisols. Although the answer to the question "Is it a feasible process?" could well be "Not at the present time," it was felt that it might be of interest to the technical reader to learn something of the background of flame-spraying plastisols, their good and bad points—in short, the conclusions of five years of work on the subject.

The idea of flame-spraying plastisol was conceived in this laboratory early in 1950. There was felt to be a definite need for a plastisol that could be sprayed on vertical surfaces and not sag or run off prior to the fusing operation. The problem faced was this: the lack of large fusing ovens would limit the future of spraying plastisols where large areas were concerned. If plastisols could be flame-sprayed—that is, passed through a flame to gel the particles, and then fused on the metal with the same flame gun—the problem could be solved.

As manufacturers of coatings, we did not feel competent to design a flame gun. We did, however, investigate existing flame guns on the market, and found that we could utilize only solid pre-plasticized pellets in them. Finally we turned to Linde Air Products Company in New York and sought to interest them in the project. (This company had already designed a flame gun to spray polyethylene.) Our project was turned over to John Powers, a young engineer with the company. In late 1950, Mr. Powers had designed a heating head that could be attached to an Eclipse 6-GP Spray Gun.

The flame spray head was designed to operate on oxygen and propane gas. For the spray gun an air supply at 60 psi was required; and for the flame head, oxygen and propane at 5 psi.

Now that an apparatus had been developed that could flame-spray a plastisol, it was necessary to develop a formula that would work satisfactorily. This proved to be an arduous task. Seven years ago dispersion grade resins did not exhibit the low viscosity that they possess today. Plasticizers themselves were not as plentiful, and they imparted high viscosities to the plastisol resins. Solvents or diluents could not be used because of their inflammability and "flash-back" tendencies. If the plastisol was sprayed too dry, the atomized particles fused in passing through the flame zone; and they did not flow out in the subsequent fusing. Also, the films were full of pinholes and, generally speaking, had a lacy structure. To alleviate this dry spray, careful adjustment of fluid and air pressure had to be maintained in the spray gun.

It was also necessary to develop an adequate air-dry primer for the flame-sprayed plastisol. Up until that time, all successful primers for plastisol had to be baked. It was imperative to have an air-dry primer. It was impossible to bake the primer long enough so that it would be structurally cross-linked. A great measure of success had been attained with a primer composed mainly of an acrylonitrile rubber fortified with phenolic resin. The vehicle used complied with military specification MIL-A-13883 (ORD). The corrosion resistance of this primer was reinforced by the incorporation of basic zinc chromate.

In the spring of 1951 the work had progressed to a point where various government agencies, as well as private ship builders, were invited to witness a demonstration of the process. This included flame spraying on steel plates, steel panels, wood, and concrete blocks. (It should be stated here that laboratory demonstrations of flame-spraying plastisol have invariably been successful. Field testing has been another story. This was not realized at the time.)

The laboratory demonstration aroused sufficient interest in Naval circles for the Navy to authorize the flame-spraying of a diving plane on a submarine, the "USS Odax" dry-docked at Portsmouth Naval Shipyard, in Portsmouth, New Hampshire. The plan was to spray one of the stern planes with plastisol, the other with Thiokol* polysulphide rubber. This comparative test was made because polysulphide rubber was the standard coating for diving planes. Polysulphide rubber provides adequate corrosion resistance; but application problems are tricky and the cost is high.

It should be noted here that diving planes on submarines are subject to severe corrosion. Stern planes are immediately aft of the ship's screws. The salt water that surges violently over the planes contains large amounts of air and oxygen. The force of the water, plus the oxygen in the sea water, causes cavitation corrosion. Approximately 25–50 mils of coating are necessary to resist the ravages of corrosion.

In this test the polysulphide rubber and the plastisol were put on simultaneously by two crews. Representatives of the two companies applied the plastisol coating, while Navy personnel applied the polysulphide rubber.

The coatings were applied in late September, 1951. A comparison of test data shows some interesting results.

Item	Plastisol	Polysulphide Rubber
1. Area Coated	102 Sq Ft	102 Sq Ft
2. Man Power	2 Men	2 Men
3. Application Time	6½ Hr	8 Hr
4. Film Thickness	23–27 Mils	25–34 Mils
5. Materials Used	½ Gal Primer ¼ Gal Thinner 2½ Gals Plastisol	150 Lb Polymer Powder
6. Cost of Materials	$22.20	$210.00

*Technical Director, The Stanley Chemical Company, East Berlin, Connecticut.

*Trademark of Thiokol Chemical Corp.

It should be further mentioned that plastisol application is a distinct improvement over polysulphide rubber spraying from the standpoint of odor. Polysulphide rubber sprayers must wear face masks.

Trouble was experienced in trying to apply a new anti-fouling topcoat to the plastisol. The Navy used Anti-Fouling Formula No. 145 on the rubber-coated plane, but this formula proved unsuccessful with the plastisol. A vinyl resin was developed—cuprous oxide topcoat carried in tetrahydrofuran solvent. The solvent proved to be an undoing, because it accentuated delamination and caused some loss of adhesion of the plastisol to the primer. In this demonstration multiple coats of plastisol of 5 mils each were sprayed and cured. Any overcuring of a single coat of plastisol was immediately detected by the tetrahydrofuran solvent. This solvent subsequently gave us a quick test for delamination.

Subsequent dry-dock work on the submarine revealed that the plastisol was losing adhesion. In October the plane was again sandblasted, and the flame-spray plastisol again applied. To aid in fusing the plastisol, a six-inch scaling gun was used in addition to the ring burner on the spray gun. The same techniques were followed as before, but because of the colder weather at the yard, the metal was pre-heated to 100–125F before spraying the plastisol.

That test pointed up many difficulties in actual field conditions. In February an attempt was made to spray a propeller strut on a destroyer in the Philadelphia Naval Shipyard. The extreme cold hampered the operations, and it was not possible to gel the plastisol, let alone fuse it!

On the basis of the difficulties encountered, the burner head was redesigned so that parallel burners were used instead of a ring burner. Acetylene was substituted for propane, so that the heat output at the head would be in the neighborhood of 1000F. A twelve-inch rather than the six-inch scaling gun was recommended to aid in fusing the plastisol after it was applied.

While waiting for final results on the submarine "USS Odax," the Portsmouth Naval Shipyard decided to run another flame-spraying plastisol test on the submarine "USS Bang." This job was undertaken in May. Two coats of primer were applied over the sandblasted metal on the day prior to the flame spraying. When the stern plane was flame-sprayed, approximately 20 to 30 mils were applied to a given area before that area was fused. It was found that by this method it was possible to prevent delamination, and at the same time effect a tighter cure. It took four hours to coat 100 sq ft of the stern plane. One man sprayed the plastisol, while another man, following closely, fused the plastisol with a twelve-inch sealing gun. The weather was fair, and the temperature in the dry dock ranged from 70 to 80F during the working day.

After a short sea trial the "USS Bang" was returned to port for temporary repairs. The plastisol coating on the stern plane had been damaged by a fouling anchor chain. It was impossible to repair the plane in the short time allotted, and this test had to be abandoned.

In the fall of 1952 the "USS Odax" was dry-docked at Groton, Connecticut. An inspection of the plastisol revealed delamination and break-through. However, the primer prevented any corrosion. The test was deemed a failure, because the plastisol was poorly fused.

Inasmuch as the first submarine was coated using the old spray head, and the second submarine constituted no true test; a third and final test was arranged in June of 1953.

The stern plane of the "USS Cobbler" was coated in June of 1953, using the latest techniques, and incorporating a new modified epoxy plastisol. In this case it took approximately seven hours to coat the plane. The weather was dry and hot.

The author inspected the plane after it had been in use one year. The over-all picture was good. Only approximately 5 per cent of the area needed patching. This was done on July 27, 1954. The Thiokol coating which had been applied to the standard stern plane had some localized rust areas, which were sandblasted and burned off.

As a result of a mix-up in orders when the "USS Cobbler" was again dry-docked, one year later in Philadelphia, the plastisol coating was not checked, and the plane was sandblasted without inspection. Naturally, all concerned were disappointed that no conclusion could be drawn at this final point.

SUMMARY

Flame-spraying plastisol would seem to offer some advantages over the conventional non-drip spraying plastisol.

Very heavy coatings can be applied to vertical surfaces without sagging. There is no tendency of the plastisol to sag during the fusing operation.

The disadvantages are:

1. The flame-spraying equipment is bulky and difficult to handle.
2. The open flame makes for a hazardous operation in some areas.
3. At freezing temperatures it is virtually impossible to pre-heat large areas of metal surface.

It is possible that flame-spraying plastisol may possess the necessary characteristics to make a good coating for propeller shafts for Naval use. Plastisols appear to be more resistant to fouling and marine growth than synthetic or natural rubber. Repair of damage to plastisol coatings is more easily accomplished. Last, and perhaps most important, plastisol offers considerable advantages from the standpoint of cost.

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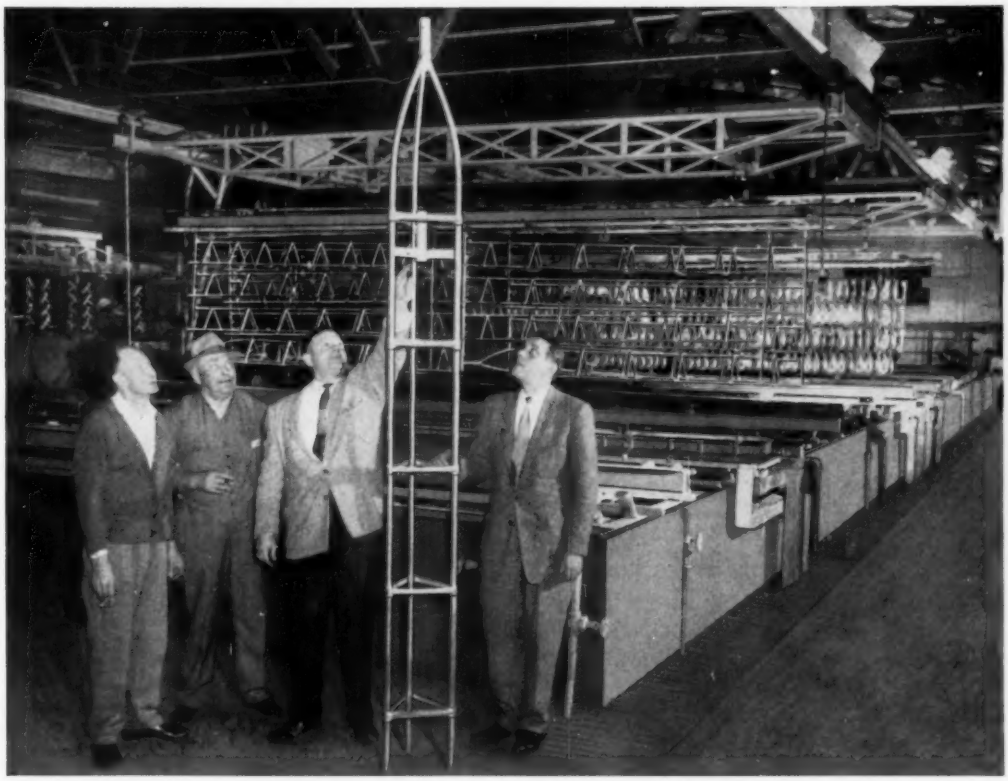
Robert F. McTague is technical director of The Stanley Chemical Company, a subsidiary of The Stanley Works, located in East Berlin, Conn.

Mr. McTague joined the chemical company as a chemist in 1940 and became research director in 1946.

He rose from private to first lieutenant in the U. S. Army Chemical Corps where he served as a member of a government research team during World War II. After his discharge he remained as chief chemist with the Rubber Reserve Corporation of the government.

A graduate of Holy Cross College, he also received an M.S. degree in chemistry there. He has completed postgraduate work at the University of Akron and Case Institute of Technology. He is a member of the American Chemical Society and the American Association for the Advancement of Science.



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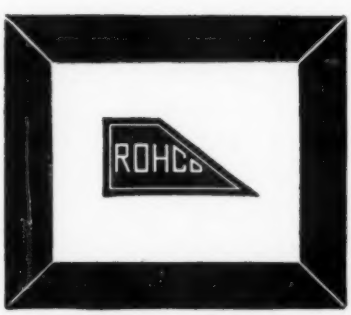

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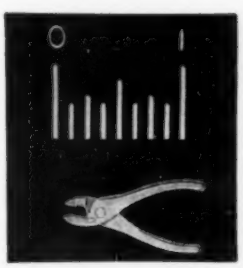

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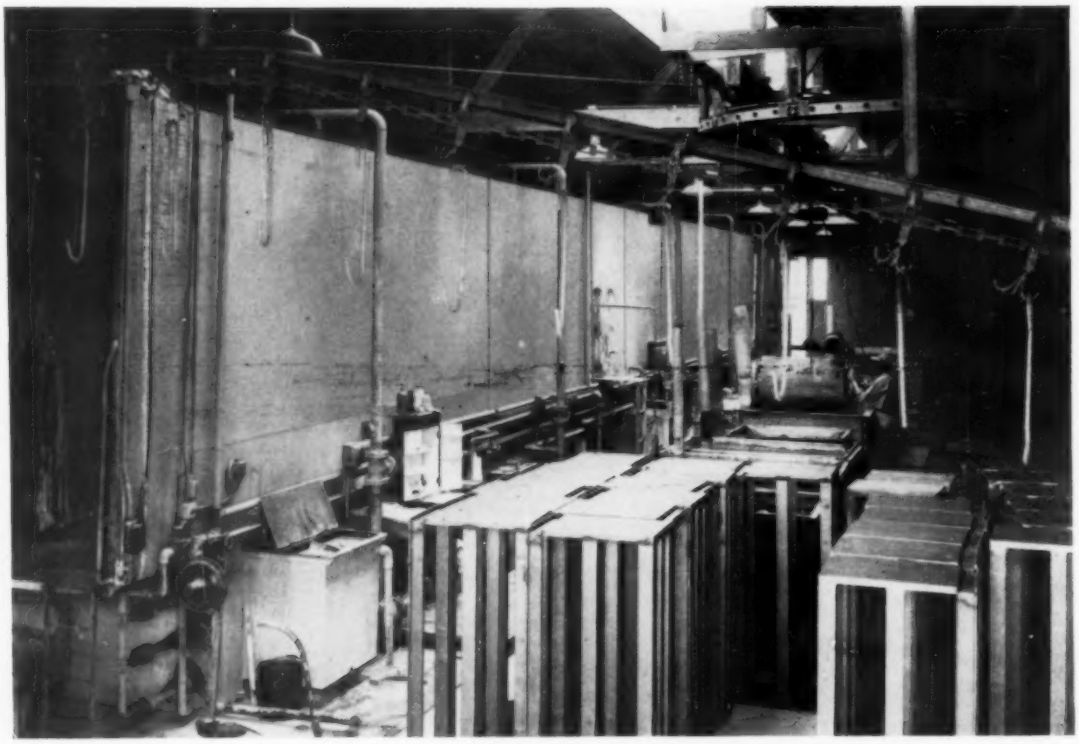

(Left) View of five-stage phosphate coating machine (Back) Several processing tanks.

SOME CURRENT APPLICATIONS OF PHOSPHATE COATINGS

by E. PAUL KOECKRITZ JR.*

PHOSPHATE COATINGS do not represent a recent innovation in metal finishing, but in a wide variety of new applications they have exhibited properties so markedly superior to other metal finishings in cost savings, increased rates of production, and quality of finish that they have become a matter of economic interest to metal parts fabricators and operators of metal finishing plants.

A major supplier of American Petroleum Institute tool fittings to the oil tool industry had been experiencing considerable shelf loss in the course of warehouse storage and overseas shipment due to corrosion on interior areas of the tools which the cadmium plating did not always reach under normal processing conditions. The problem was solved with a chemical conversion phosphate coating which modified the metal without appreciably changing its manufacturing tolerances. Variations introduced in the fittings were of the order of one and one-half to two ten-thousandths of an inch. Being a non-electrolytic treatment, the phosphating process treated all areas identically, including threads, bearing contact areas,

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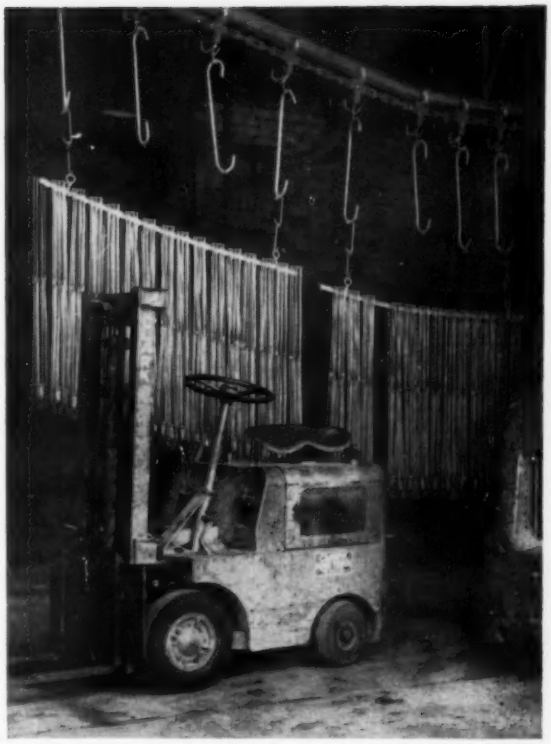
and sections having holes and recesses. The phosphate coating formed an insoluble chemical bond with the metal, which retained its original appearance not only during shelf life but also during actual service. However, inhibiting corrosion in this case was not the only factor gained here. Galling of the threads was also completely eliminated.

In the phosphate coating process, parts are carried in baskets, tumbling barrels, or on special jigs through a series of cleaners, rinses, and coating compounds. They are then given a final finish, which may be a lacquer, a stain, an enamel, a dry film lubricant, a soft film lubricant, or a non-drying, rust-preventive finish, depending upon the specific application for which the article is intended.

PHOSPHATE COATING IN NUCLEONICS FIELD

Phosphate coatings have recently won new acceptance in the field of nucleonics. A West Coast designer and manufacturer of nuclear reactors required a metal finish capable of meeting the exacting requirements of corrosion resistance for reactor tubes and plugs, those devices that are lowered into the highly radioactive atmosphere of a "hot chamber to position the article that is to be exposed to radiation. An electroless nickel process had been employed in finishing the tubes and plugs, but it proved to be time-consuming, costly, and lacking in eye appeal, a weighty consideration since the reactors are a high-cost, custom-built item sold principally to colleges and universities in this country and delivered overseas for use in pilot installations of nuclear research.



Beach umbrella frames to be phosphate coated and flow coat painted.

Galvanized phosphate-coated picket fence entering flow coat tunnel.

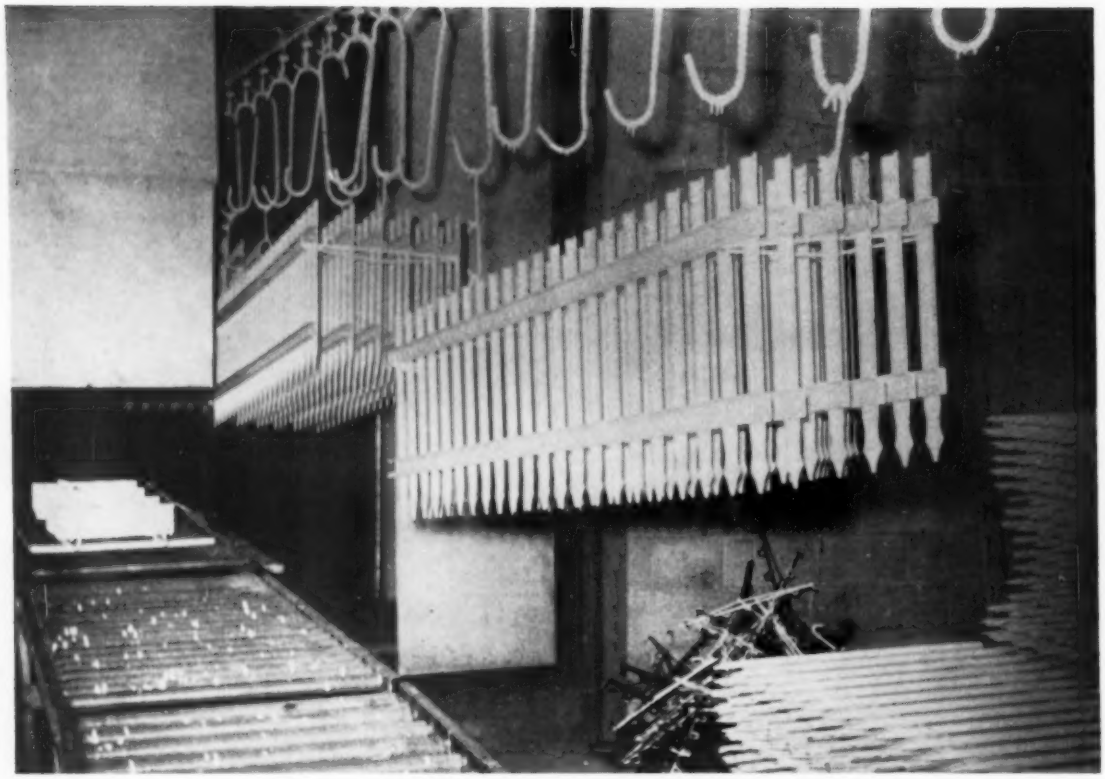
A phosphating process was recommended which was to be followed by a base primer and two coats of lacquer. With this finishing procedure, it was possible to realize a 50 per cent saving in production costs and a substantial saving in processing time. To date units for five reactors, have been processed and shipped to all parts of the world.

In a custom finishing shop, much work is performed for industries which have only intermittent need for phosphate treating, and for other finishing concerns whose facilities are such as to make installation of phosphate treating equipment in their own plants undesirable. Installations for the various types of phosphate coating processes are quite sizable.

An engineering feat was recently accomplished when a major West Coast rocket activity required six welded rocket propellant fuel containers to be finished. They measured 14 feet in length, six feet in diameter, and weighed 18,000 pounds apiece.

TWO TYPES OF PHOSPHATE COATINGS APPLIED

It was decided to apply two types of phosphate coatings, one to the inside of the chambers immediately after the normalizing operation for stress relief while the vessels were still warm, and the other, a cold application, to the outside. Each still-warm vessel was individually transported on a trailer to the plant. The trailer was then backed up to the processing equipment, and the finish was applied by pumping the processing solution through the vessel without ever removing it from its trailer bed. The cold-type phosphate coating was then applied to the exterior, followed by a zinc chromate primer.



Steel picket fence leaving bake oven after receiving one of three coats of enamel.

Phosphate coatings proved to be one of the most economical finishing methods capable of meeting the rigorous specifications for corrosion resistance required in an application of this type.

Inspection of phosphate finishes is facilitated by the uniform gray crystalline coating, and the fact that the coating will not take if the part is not clean. For certain applications it is imperative that the finish be completely free of any trace of oil, such as might occur, for example, in oxygen or nitrogen cylinders. A particle of oil in a rocket fuel propellant container, for instance would trigger a combustion process upon exposure to the propellant. Similarly, traces of oil in a liquid oxygen container would combine with the oxygen in spontaneous combustion. The extraordinary affinity for oil exhibited by the correct phosphate coating is particularly useful for detecting its presence, and in consequence most oxygen containers today are phosphate coated. The slightest trace of oil is held by the coating, and produces a telltale discoloration which is readily discernible under even the most cursory visual inspection. This characteristic made it possible to inspect the finished propellant containers visually.

Another application in which the use of phosphate coatings is steadily expanding is that of a paint base. It had formerly been held that paint performed a protective as well as a decorative function, but studies have shown that paint is permeable both to oxygen and to water, and that by itself it affords inadequate physical protection to the surface it covers, because in most cases cleaning or degreasing alone does not assure the proper bond. Phosphate treatment, however, not only supplies the necessary protection against corrosion, but extends the life of the paint coating many fold and helps to assure that every part will have proper protection and appearance. About 98 per cent of all automotive manufacturers today employ a phosphating process of some type under painted or lacquered parts.

One conversion treatment causes a layer of extremely fine, insoluble, non-metallic phosphate crystals to be formed integrally with the surface of sheet metals, die castings, stampings, and fabrications. The formula is varied slightly to adapt it for treating steel, aluminum, zinc, or alloys and combinations of any of the three, as well as for mill-treatment of sheet steel, zinc-coated steel, or aluminum. The finishing material that flows between the crystals forms an especially lasting bond that is nearly impervious to chipping, peeling, or flaking. When the base metal is exposed by gouging or scratching, rust and corrosion are confined solely to the exposed areas; the spread of corrosion beneath the paint covering is effectively inhibited by the phosphate coating.

During the exigency of a peak production period, a West Coast manufacturer of paper cutters had fallen into the practice of vapor degreasing the cold-rolled sheet metal stampings for the cutters in readiness for enameling. Owing to the large quantities of material scheduled for enameling, it frequently became necessary to store the stampings. Cleaned and untreated, the stampings readily corroded. Two-thirds of the stored stampings required additional cleaning and pickling before enamel could be applied. The stampings were processed and returned to the manufacturer's warehouse. Protected by the phosphate coating, the parts could be stored indefinitely,

and were ready to receive the final enamel coating at any time. No further preliminary processing was necessary.

Because phosphate coatings have been with us for about 40 years, and have found increasing acceptance among manufacturers of automobiles, refrigerators, and builders' hardware, a few concerns have come to look upon them as commonplace, and persist in ignoring the need to select the proper phosphate coating to do a specific job. In one such case, the staff of a refrigerator manufacturing concern, upon being made acquainted with a few of the features of phosphate coatings, straightway had a processing system installed in their own plant. It was a good process, but the wrong one for their purpose. Rejects increased. Delivered jobs failed. It became necessary to strip, re-treat, and re-enamel all parts.

Phosphate coatings are also used as surface lubricants. This variation of the phosphating process chemically converts the surfaces of steel and iron pieces into a porous, oil-absorptive coating of iron and manganese phosphates. It is ordinarily applied to wearing surfaces to permit rapid breaking-in of moving parts without scoring and scuffing. Lubricant is held by a phosphate coating and also by pores produced in the base metal by the conversion process, thus preventing metal-to-metal contact and assuring a film of oil between moving parts. To obtain maximum wear resistance on coated articles, the cleaning and coating process is varied for different metals and different applications.

AUTOMOTIVE USES

Phosphate surface lubricating is typically used in the manufacture of automotive parts, such as pistons, differential gears, cam shafts, cylinder liners, pistons, piston rings, tappets, rocker arms, clutch parts, springs and bearing races. The process is also used on compression pistons for refrigerators, propeller shaft nuts, steel fan pulleys, and in virtually all machine assemblies in which wear and corrosion resistance are factors.

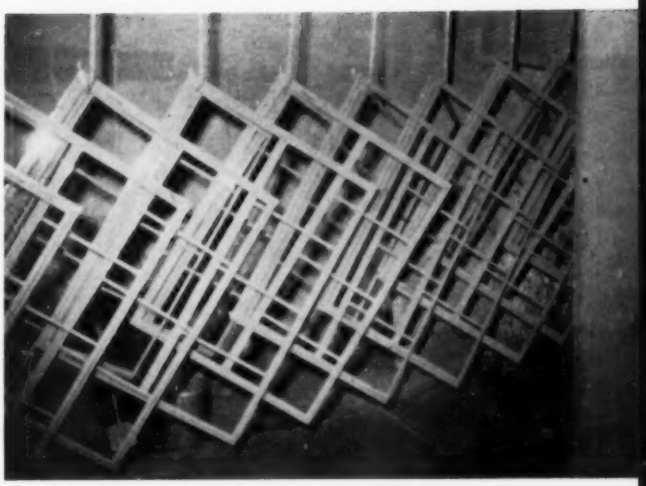
The operator of a finishing plant, because he makes it a point to keep pace with the latest advances in metal working and finishing technology, can offer useful advice, not only on the finish but on the fabrication of an article as well, so as to facilitate finishing the article at the lowest cost.

The myriad uses of phosphate coatings remain yet to be completely explored. One of the most promising avenues of further development in the use of phosphate coatings is in the production cold forming of metals, such as extrusions, cold heading, tube drawing and wire drawing.

Rocket tubes are now formed by the cold extrusion of phosphate coated aluminum. Following fabrication, the tubes are treated with other phosphate finishes for paint adhesion and corrosion resistance. A special coating has been developed for use with stainless steel, which permits the cold heading of stainless steel bolt stock and the cold reduction of stainless wire and tube. In our own plant we are currently using coatings as anti-galling agents for threaded products of stainless steel, mild steel, and even higher alloy steel.

The aircraft industry on the whole has generally favored lightweight aluminum, magnesium and titanium, but has been forced by considerations of certain strength factors to also use steel. Phosphate treatments can aid them in the fabrication as well as in the protection of these steel parts.

The coatings used in cold forming metals are specially adapted for this function, and differ slightly from the coatings



Steel window sash leaving flow coat tunnel.

applied for protection and corrosion resistance. The nonmetallic phosphate coating is integral with the surface of the metal to which it is applied. The cold forming lubricant applied over this coating chemically combines so that it becomes integral with the coating. This is what acts to prevent metal-to-metal contact of die and mandrel, and serves to prevent welding and galling.

Articles cold formed with phosphate coatings are often so free of scratches and scoring that final polishing and metal finishing operations can be frequently dispensed with. In the die, the coating undergoes ironing, but being integral with the metal surface, it merely becomes a thin, uniform, and even more rightly adherent layer than before. The reduction in friction lessens wear and increases the service life of drawing tools; it also permits greater reductions per draw and at higher speeds with complete safety.

Recent developments in phosphate coatings have opened so many new vistas in metal fabrication and finishing that even more widespread adoption of this type of treatment is anticipated. Phosphate coatings meet a great many military specifications for organic finishing. They entail relatively low cost, require less time to apply than other finishes, and (at least for many clients) have consistently led to marked savings in production costs, especially when rejects are reduced and the finish guaranteed to perform properly.

E. Paul Koeckritz Jr. has been in the job shop metal finishing business for 18 years. He began work with his father, the founder in 1933 of L. A. Parkerizing Co. He later studied chemical engineering and upon completing the course, returned to L. A. Parkerizing. Mr. Koeckritz became general manager in 1950. He is a member of the National Association of Corrosion Engineers and the Metal Finishing Association.

INDUSTRIAL FLOW COAT PAINTING IS HERE TO STAY

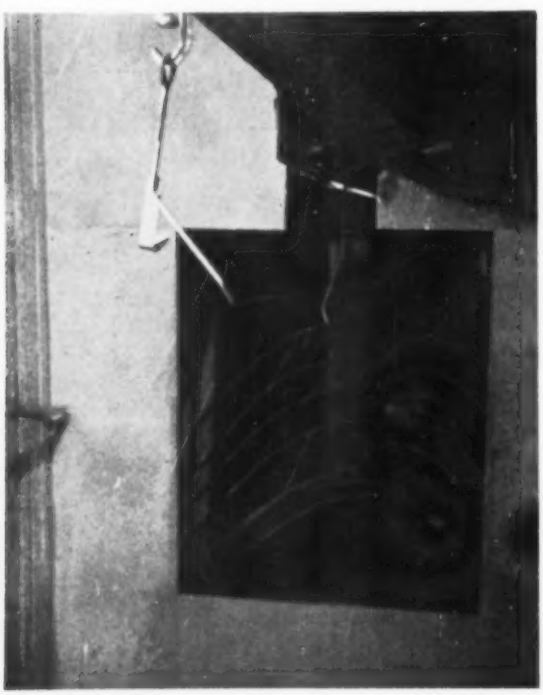
by E. A. ZAHN*

THE PRICE OF A GALLON of industrial paint is going up. It can't go down because it hasn't kept pace with the price increases of other industrial raw materials. The gallon price today is hardly any different than it was ten years ago. Paint industry competition has kept the price down but new raw materials and new application method needs will, of necessity, raise the prices to a more appropriate level.

Probably due to the anticipated gallon price increases, painting methods are being reviewed and studied much more seriously than ever before. Naturally, the high utilization methods, or rather those with 100 per cent utilization possibilities are being favored. Among these, and leading the field, is flow coating.

The flow coat painting process secrets have finally been replaced with some common sense. For a time only a few specialized paint suppliers were sufficiently experienced to supply the flow coat user. If there ever has been any reluctance on the part of the paint supplier to cooperate in view of the reduced volume of paint used, competition again has solved that problem. All paint suppliers are now familiar with the process requirements. Strangely, paint reformulation to accommodate flow coating is not necessary. A restudy of paint solvents used is necessary however, and, fortunately, with additional advantages to the user. The need for thinning is also greatly reduced so that in some instances, drum viscosity is ideal for flow coat application and the expensive solvent losses have been all but eliminated

*Industrial Finishing Consultant, Louisville, Kentucky.



Looking into the flow coat chamber with the nozzles in operation. A work part has just passed the first nozzles and is about to enter the solvent vapor chamber.

The basic principles involved in a modern flow coater include (1) an entrance vestibule, (2) a nozzle chamber, and (3) a solvent vapor chamber. The equipment is, of course, conveyorized. Normally, in low pressure flow coating, two gear pumps are used. The main supply pump delivers the paint to the stationary nozzle group at a pump head pressure below ten psi. The pump, by valve manipulation, is also used to flush the equipment tunnel and nozzle chamber with flushing solvent at the end of each day. The flushing solvent is then used for maintaining the operating viscosity. The viscosity may be controlled automatically or by hand.

The second pump is of smaller capacity, and usually about 40 gpm and serves the entire equipment. It moves the paint at 40 gpm through a power-driven filter, then through a heat exchanger for paint temperature control, and then back to the supply tank. The service pump is also used for loading and unloading the equipment and it may be used to agitate the paint after equipment shutdown.

The total equipment is light in weight. It can be mezzanine or roof mounted. There are no floor pits necessary and it is a straight-through process utilizing the same work hangers that accommodate the washing cycle.

Standard three-eighths in. aluminum nozzles are used. These may vary in number from 25 to 75 depending on the work part dimensions. The supply pump capacity requirements is estimated from the number of nozzles required for the job. Each nozzle requires a 3 gpm material supply.

Common sense in flow coating is now the byword. Every advantage of the process can be easily explained. Process simplicity is always favored by the user. The flow coat process of painting now ranks first among all methods in simplicity. This is true even when compared with the simple dip painting method. There are no air pockets and no part buoyancy problems as in dipping. Only about 10 per cent as much paint is in process in flow coating as compared to dipping. The paint is merely spilled leisurely,

Work emerging from the flow coat chamber.

under very low pressure, over the work as it travels through the nozzle station. A surplus is applied and there are no inaccessible areas. The work enters a vapor controlled tunnel where the paint is allowed to find its own level. That's all there is to it. No paint is wasted.

The flow coat process of painting is gaining rapidly in Europe. There, in view of the high cost of raw materials, it is essential that high utilization be considered. While the flow coat process was first used in the U. S., the Europeans have made many contributions to its final development both as regards paint materials and equipment.

Flow coating in the U. S. and Canada has enjoyed popularity growth beyond any other application method except the spray gun. It would be well to remember that beautiful finish coats were applied by flow coat to complete automobile bodies prior to the general adoption of nitrocellulose lacquers in 1923 and 1924. Lacquers brought us the spray gun, of necessity, and these lacquers in general have lived a full life and still compete with the new synthetic enamels. The present day synthetics lend themselves even better to flow coating than the old 1920 and 1921 natural raw material enamels.

The first fully automatic industrial flow coater was used in 1947. By 1948, four copies of it were in full use. By May 1955, there were 4000 installations. That represents a process adoption increase of 1000 per cent in seven years. It is estimated at the present time that there are 5600 installations in the U. S. and Canada. While the Europeans may never equal the number used in the U. S., the rate of adoption is even greater than here.

A common problem with all application methods other than flow coating is the one of inaccessible areas on the painted parts. Every bit of the surface needs protection. An unpainted hidden flange can be the source of early paint failure. All spray processes, whether hand, automatic, or electrostatic, have this common problem.

The perfection potential is best achieved by the flow coat process. The paint materials are less distorted by over-thinning and by atomization. Naturally, no single application method is ideal for all applications. However, more perfect finishes can be applied on a greater variety of products by flow coating than by any other method, according to some enthusiastic users. There are many products which cannot be properly painted by any other method.

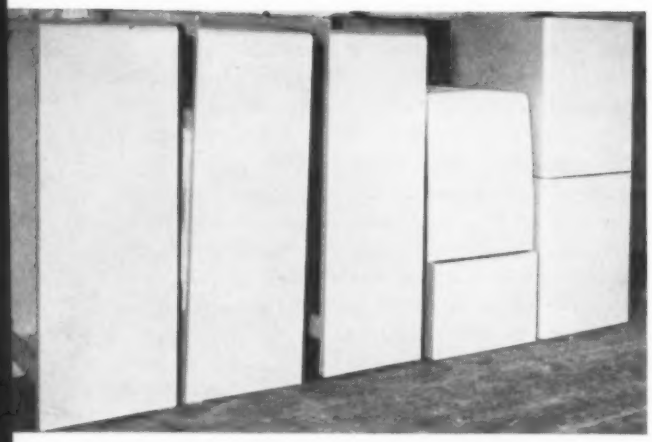
Compared to hand spray painting, flow coating has an efficiency record of up to 99 per cent and can reduce the amount of paint used by 60 per cent or more, depending on the product being painted.

Compared to conveyorized dipping, the flow coat process operates with higher material solids—and with as little as 10 per cent as much paint material in process. Due to the vapor chamber leveling feature, the film gradient in flow coating is much less than with dipping.

Compared to electrostatic painting, much less or no hand supplement is required. The flow coat process is non-royalty.

Flow coat equipment costs are lower than those of any other painting method. Complete equipment amortization has been realized in as little as five weeks of production

A conventional washing machine skirt is shown in the vapor tunnel. At this point, most of the bubbles have already disappeared and the film has begun to find its own level. The self-corrected nozzle pattern can be seen in the background.



A variety of major appliance cabinets that have been flow-coated with one coat of enamel to a complete finish. All interior and exterior surfaces are coated automatically. The average film thickness on these parts is one mil ranging from 0.75 mils at the top to 1.2 mils at the bottom. Ten per cent of the upper exterior surface is hand supplemented by spray, while wet, to equalize the top-to-bottom film thickness. Less than seven per cent of the exterior dried film is applied by hand supplement.

operation. Many equipments have been amortized in from fifteen weeks to six months.

The films produced by flow coating are denser and give better field performance. The flow coat applied film is always continuous regardless of film thickness. There are no part-size limitations.

For some years, the flow coat process of painting was considered useful only for the really big users. This is no longer true. Today, the small user, using as little as three drums of paint a week and with one spray operator, can improve his operation by adopting flow coating. The equipment builders and the paint suppliers have both realized that today's so-called small business is, in reality, our nation's big business. Flow coat equipment and flow coating paints, for all practical purposes, are now considered catalog items.

For those users who presently use hand-application methods, who want to improve and to know the potential savings by a change to flow coating, need only take a figure representing 60 per cent of their total yearly paint and painting labor costs to find the answer.

Flow coating equipment costs have been confusing to the small user because he has not investigated them thoroughly. The costs are lower than new installation costs of any competitive painting process. The improvements in protection and appearance of the applied films are additional advantages beyond the known savings in material and labor. Many smaller installations have been amortized in six months—some in even less time. There have been no failures of the process recorded.

In the beginning, flow coating was considered a potential "bomb" so far as safety was concerned. Again, common sense has shown that flow coating may now be considered a comparatively safe process. There is no atomization of explosive materials and there is no high voltage necessary. No operators are exposed inside of the completely enclosed equipment. The entire installation is equipped with automatic fire protection equipment.

The non-users always have been concerned about the flow coat operator training problem. The process users have found that a flow coat equipment operator can be trained more easily than a hand spray operator. Usually, the assigned operator is already self-trained by the time the installation is completed.

Flow coating is fully automatic, which in itself is a very desirable improvement. Product uniformity is worth a great deal. It sets a healthy trademark standard.

In everything that involves motion, there is a desirable optimum. Operation optimum in industrial painting is to load the uncleaned work parts onto a conveyor and unload neatly finished parts at a point of completion. When the paint is applied, flow coating utilizes the same part hanging angle as the power washing machine, avoiding costly work re-positioning. The paint is leisurely spilled onto the work through a simple pumping system and automatically leveled in the vapor chamber. This appears to be near the optimum.

Unknown quantities of small products are being painted by the flow coat process. Size limitations are no longer a problem. One user paints a 1500-part variety with a single machine nozzle setting. Another user is painting 60-foot long fabricated truss sections, horizontally, by the flow coat process.

There is plenty of help available for the new user through his paint material and painting equipment suppliers. Process specializing, of course, has resulted in process experience and specialized experienced suppliers are always a big safety factor for the new user.

Small pilot laboratory equipment is available for those who want advance evidence of the flow coat application possibilities. The original hazards of flow coating were based on the gradient in film thickness from the top to the bottom of a piece. This was a real problem at one time but has been all but eliminated now.

Most paint manufacturers and more than a dozen finishing equipment builders are sufficiently experienced to help prospective users who may investigate the advantages of the flow coat process of industrial painting.

E. A. Zahn has spent twenty-eight years in research on industrial paints and application-methods.

He is the inventor of the Zahn Viscosimeter and has acted as consultant to many manufacturing concerns. In 1938 he received the Charles A. Coffin award for contributions made to the electrical industry. Zahn has been associated with General Electric for twenty-eight years, and is at present a consultant for private industry with both National and International accounts.

SIMPLIFIED METHOD FOR LINING CONCRETE SURFACES

An Inplant Organic Application

by WILLIAM W. CLARKE*

To PREVENT THE LOSS of valuable plating solutions in the event of failure or damage of plating tanks, a major automotive manufacturer recently installed a series of emergency storage pits below floor level. The pits, 7 feet deep by 10 feet wide, form a row 480 feet long beneath a truck aisleway which parallels an automatic chrome plating machine handling bumpers.

Each pit is connected to a plating tank of corresponding size by a sump located beneath the tank, so that jettisoned plating solutions are kept separated and intact in individual pits until tank problems are corrected.

Location of the pits beneath the truck aisleway was dictated by space shortages in the department, and since excavation was necessary, concrete was chosen as the most practical construction material.

To prevent contamination of the solutions while in the pits, and to insure the protection of the concrete against strong solutions, all interior surfaces of the pits were lined with plastic sheet lining material. Normally such linings must be attached by adhesives to metal surfaces, and where concrete surfaces are involved a metal shell must first be installed over the concrete. In this instance, however, the project engineer specified a lining which completely eliminates the need for metal interlining, and makes adhesives unnecessary in all but floor slab areas.

The material selected was a polyvinyl chloride sheet of patented design,† smooth-faced on one side and T-ribbed on the other. Aside from its complete resistance to all solutions encountered in the process, the principal reason for choosing the ribbed sheet is that the ribs become mechanically locked into the concrete surface during pouring. The concrete surrounds each T-rib, leaving it permanently embedded in the wall.

The lining material is customarily installed by a qualified

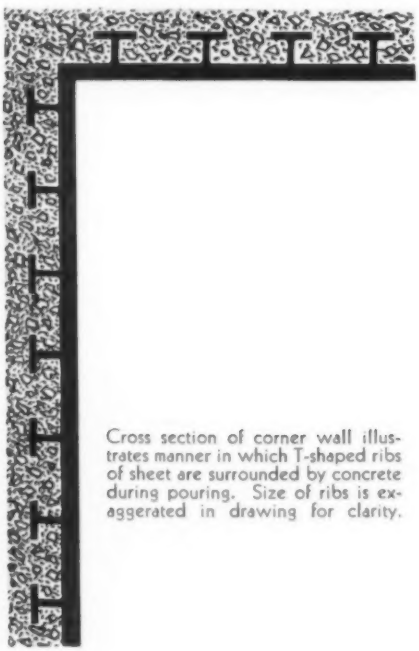
Joints are sealed by heat-welding a strip of the lining material over butted edges of adjacent sheets. For corner joints, welding strip with a 90° cross section is available.

*Field Engineer, Amercoat Corporation, South Gate, California.
†T-Lock Amer-Plate.

applicator who has the benefit of special training provided by the manufacturer. This gives assurance that the work will be done in factory-approved fashion for best results. Installation of the pit lining was performed by such an applicator.

First step in construction after excavation was to pour the bottom concrete slab and trowel it smooth. Standard plywood forms were then made for the side walls, and the smooth side of the sheet was fastened to the exterior of these forms with small brads.

When the forms were set in place, concrete was poured against the ribs of the lining, mechanically locking the sheet to the wall. Forms were then stripped to expose the smooth side of the lining inside the pit. The same process was repeated on the forms for the ceiling slabs, which were fabricated separately and later laid over the pits to restore the truck passageway.



Cross section of corner wall illustrates manner in which T-shaped ribs of sheet are surrounded by concrete during pouring. Size of ribs is exaggerated in drawing for clarity.

SHEETS HOLD FIRMLY

After removal of all forms, the floors of the pits were lined with unribbed sheets of the same lining material, using special adhesive to bond it directly to the concrete. No metal interliner was needed for the plain sheet, which holds firmly after the adhesive has set.

The entire lining was then sealed against leakage by heat welding narrow strips of the same material over all seams and joints. By this process, individual sheets were welded together to form a continuous lining. Following welding, all surfaces were tested with a nondestructive holiday detector.

The project engineer reports that this installation has given trouble-free service for nearly a year, and no difficulties are anticipated.

Although the T-ribbed lining material is designed specifically for new concrete work, the plain sheet may be used for all steel, wood or existing concrete tanks and vessels, using the special adhesive. The resulting membrane is impervious to all plating solutions at customary concentration levels up to 180F.

While the sheet is thermoplastic, retaining flexibility over a wide temperature range, it is completely nonflammable and will not support combustion. It will char when in direct contact with flame but extinguishes itself when the flame is removed. Neither does the sheet contain lead pigments which might contaminate plating solutions.

William W. Clarke is a member of the field engineering staff of Amercoat Corporation, operating out of North Central District headquarters at Evanston, Illinois. For the past seven years he has been serving industry in the Midwest as a corrosion specialist, and has accumulated broad knowledge of corrosion problems encountered in the plating field. Mr. Clarke acquired his knowledge of mechanical engineering at Cass Tech and is a member of the National Association of Corrosion Engineers.

CORRECTION

The illustration for Fig. 4 for the paper "Corrosion Studies with Nickel-Chromium Plate" by H. Brown, M. Weinberg and R. J. Clauss in the February 1958 issue of PLATING, page 146, appears upside-down. Consequently, the left and right bumper guards should be reversed when comparison is made with the caption.

BUTYRATE LACQUER USED TO PROTECT ALUMINUM

A forward step has been claimed in the development of an effective protective coating system for outdoor aluminum with the first large-scale coating of a modern American industrial building by means of a butyrate lacquer.

Aluminum panels exposed for three years at the American Sterilizer Co. plant in Erie, Pa. exhibited dulling surfaces and accumulation of dirt and grime. Two goals were set: 1) To restore the aluminum as nearly as possible to its original appearance, 2) to be able to preserve the restored finish against recurrence of the dulling, corrosion and pitting—all of which had accelerated the accumulation of air-borne grime during the three years of exposure.

Following cleaning and surface restoration, butyrate lacquer was applied to all panels and subjected to nine months' exposure before a final decision was made. The tests showed the coating to be non-yellowing under constant sun exposure, and to have completely prevented oxidation of the surfaces. The half-second

Coating of butyrate lacquer applied with a standard spray gun on restored surfaces and recesses.

butyrate component of the lacquer which gives the formulation its characteristic protective features of non-yellowing and resistance to weathering was developed by Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company.

So successful were the tests after the nine-month exposure to direct sunlight, atmospheric fumes, and other weathering influences it was decided that the surface be cleaned and coated as the best method for achieving and preserving a complete restoration of the original aluminum finish.

Treatment of the exposed aluminum prior to coating required that all oxides and soil be removed in order to present a completely greaseless, clean surface for the lacquer. This was accomplished by first brushing a water solution of a chemical cleaner and brightener, directly onto the surface of the aluminum. In addition to removing dirt and grease from the surface,

(Continued on page 272)

MILWAUKEE'S INFANT ORGANIC DIVISION MATURED

by

Leslie L. Dively
Finishing Engineer
Cutler-Hammer, Inc.

Ed. Note: A year ago, Mr. Diveley, one of it creators, reported on the pioneering project forming an Organic Division launched by the AES's progressive Milwaukee Branch. This is a sequel to that account and presents a Milwaukee progress report a year after that project's debut.

The Organic Division of the Milwaukee Branch can no longer be considered to be an experimental project. After fourteen months the Division has more than fifty members, thirty of whom are exclusively interested in organic finishing.

Attendance at organic technical sessions has averaged forty-five.

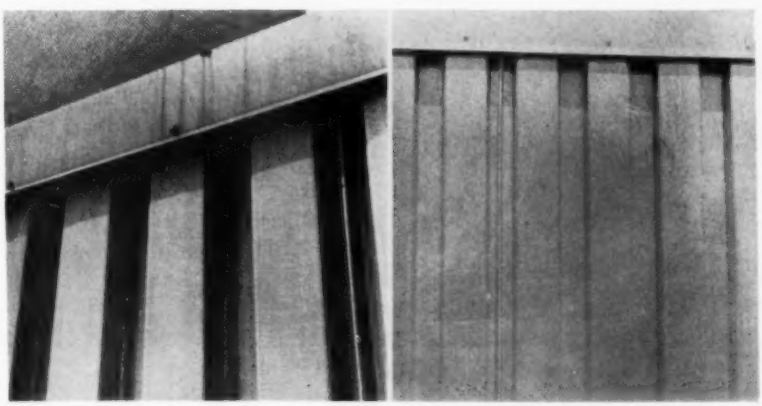
Ten programs have been presented covering the following subjects: 1) "Review of Paint Applications", 2) "Finishing and Decorating Metal Containers", 3) "Cause and Cure of Some Common Defects in Paint Films", 4) "Mechanism and Value of Phosphate Coatings", 5) "Metal Cleaning", 6) "Manual Spray Techniques", 7) "Resins and Their End Uses", 8) "Automatic Paint Application", 9) "Stripping", 10) Industrial Phosphate Coating Treatments".

Sufficient material remains to insure excellent programs for a long time to come.

Two problems now face the managers. One is to obtain adequate and convenient space for a divided meeting. The other is concerned with the manner in which Organic Division members may be induced to participate more actively in the affairs of the Branch. The second vice president and the assistant librarian are members of the Organic Division and are performing the duties of their offices very efficiently, but more members of that Division should be interested in the business of the Society.

An increasing number of platers who never before professed any interest in organic coatings are finding it difficult to decide which technical session to attend. That problem is, of course, common when dual sessions are held and no solution will be possible until the membership is substantially larger than at present. The Divisions may then have separate meeting nights.

The officers have received inquiries from other Branches concerning details of Milwaukee Branch activity in the organic coating field. They are happy to reply to such inquiries and to assist other Branches in any way possible.



(Left) Close-up of aluminum wall panels after four years' exposure to weathering shows dulling and pitting on both horizontal and vertical surfaces. (Right) The same wall panel as pictured at left with the bright, clean aluminum surface protected against recurring deterioration with a fine coating of clear, butyrate lacquer.

TENTATIVE PROGRAM
45th ANNUAL CONVENTION
AMERICAN ELECTROPLATERS' SOCIETY, INC.
Hotel Sheraton-Gibson, Cincinnati, Ohio
May 18-22, 1958

SUNDAY, MAY 18

9:00 a.m.	Executive Board Meeting (All Day)	Parlor F
9:00 a.m.–9:00 p.m.	National Association of Metal Finishers (NAMF) Registration	Ballroom Lobby
9:30 a.m.	Annual Meeting (NAMF)	Parlors 7, 8 & 9
1:00–8:00 p.m.	Registration	Ballroom Lobby
1:30 p.m.	Board of Directors (NAMF)	Parlor 1
2:00 p.m.	Trustees' Meeting, Metal Finishing Suppliers' Assn. (MFSA)	Parlor E
4:00 p.m.	Credentials Committee	Parlor N
8:00 p.m.	Get-Together Party	Roof Garden

MONDAY, MAY 19

9:00 a.m.–5:00 p.m.	Registration	Ballroom Lobby
9:00 a.m.–5:30 p.m.	Registration (NAMF)	Ballroom Lobby
9:30 a.m.	Secretaries' Meeting (NAMF)	Parlor 1
10:00 a.m.	Opening Session	Roof Garden
11:00 a.m.	Business Meeting, Supreme Society	Sheraton Room
12:00 noon	Branch Secretaries' Luncheon	Parlors 4 & 5
12:00 noon	Ladies' Luncheon	Colony Restaurant (Swifton)
12:00 noon	Luncheon Meeting (MFSA)	Ballroom
12:15 p.m.	Speakers' Luncheon	Parlor 6
2:00 p.m.	Educational Session A	Roof Garden
2:00 p.m.	Inspection Trip (Buses leave about 1:00 p.m.)	Cincinnati Milling Machine
2:00 p.m.	First Educational Session (NAMF)	Sheraton Room
2:30 p.m.	Editorial Board Meeting	Parlor 1
4:30 p.m.	Order of Past Presidents, Business Meeting	(To be announced)
6:30 p.m.	Past Presidents' Dinner	Parlor 6
7:00–9:00 p.m.	Registration	Ballroom Lobby
9:00 p.m.	Open House (MFSA)	Roof Garden

R. E. Winterman
Program Chairman

W. W. Loveless
Hotel Chairman

C. Wise
Convention Chairman

E. A. Blount
Convention Co-Chairman

R. D. Miller
Educational Chairman

W. B. Stephenson Jr.
Educational Co-Chairman

A. R. Waters
Banquet
Chairman

E. Roof
Registration
Chairman

Mrs. R. D. Miller
Ladies
Chairman

Mrs. W. Young
Ladies
Co-Chairman

S. Chipman
Entertainment
Chairman

TUESDAY, MAY 20

8:00 a.m.	Membership Committee Breakfast	Parlor H
8:00 a.m.	Speakers' Breakfast	Parlor 6
8:30 a.m.	Golf Tournament (MFSA) Kenwood Country Club	Kenwood
8:30 a.m.	Second Educational Session (NAMF)	Parlors 7, 8 & 9
9:00 a.m.–12:00 noon	Registration	Ballroom Lobby
9:00 a.m.	Public Relations Committee Meeting	Parlor 1
9:00 a.m.	Educational Session B	Ballroom
9:00 a.m.	Educational Session C	Sheraton Room
9:00 a.m.–12:00 noon	Registration (NAMF)	Ballroom Lobby
12:00 noon	Michigan State Alumni Luncheon	Parlor H
1:00 p.m.	Picnic	Coney Island
6:30–8:00 p.m.	Registration (NAMF)	Roof Garden Mezzanine
7:00 p.m.	Reception & Cocktail Party (NAMF)	Roof Garden
8:00 p.m.	Annual Banquet (NAMF)	Roof Garden

WEDNESDAY, MAY 21

8:00 a.m.	Research Committee Breakfast	Parlor 1
8:00 a.m.	Speakers' Breakfast	Parlor 6
9:00 a.m.–12:00 noon	Registration	Ballroom Lobby
9:00 a.m.	Educational Session D	Ballroom
9:00 a.m.	Educational Session E	Sheraton Room
9:00 a.m.	Research Committee Meeting	Parlor 1
9:00 a.m.	Educational Committee Meeting	Parlor F
12:00 noon	Branch Librarians' Luncheon	Parlor H
12:00 noon	Ladies' Luncheon	Roof Garden
12:00 noon	Speakers' Luncheon	
2:00 p.m.	Research Committee Meeting	Parlor 1
2:00 p.m.	Educational Session F	Ballroom
2:00 p.m.	Educational Session G	Sheraton Room
9:30 p.m.	Floor Show and Dance	Roof Garden

THURSDAY, MAY 22

8:00 a.m.	Speakers' Breakfast	Parlor 6
9:00 a.m.–12:00 noon	Registration	Ballroom Lobby
9:00 a.m.	Business Meeting, Supreme Society	Sheraton Room
9:00 a.m.	Educational Session H (Panel: "Practical Plating Problems")	Ballroom
9:30 a.m.	Inspection Trip—(To be announced)	
12:00 noon	Ladies' Luncheon	Netherland-Hilton
2:00 p.m.	Business Meeting, Supreme Society	Sheraton Room
2:00 p.m.	Inspection Trip—Electric Auto-Lite, Sharonville (Buses leave about 1:00 p.m.)	
2:00 p.m.	Ladies' Plato Party	Netherland-Hilton
7:00 p.m.	Banquet and Dance	Hall of Mirrors

L. J. Howald
Publicity
Chairman

L. A. Critchfield
Coordination
Chairman

R. A. Barry
Plant Visitation
Chairman

A. J. Gerada
Athletic
Chairman

R. K. Rarick
Finance
Chairman

many happy returns of today

Thanks to our doctors, most Americans can look forward to longer and happier lives than ever before. Some of our deadliest diseases have already been conquered; others are fast being brought under control. Even with cancer, much progress has been made.

Today, more than 800,000 Americans are alive and well, cured of cancer . . . many of them, because they made a habit of having thorough health checkups every year no matter how *well* they felt . . . many others, because they went to their doctors at the first sign of any one of the seven danger signals that may mean cancer . . . *all* of them, because they went to their doctors *in time.*

To learn how to guard *yourself* against cancer, call the American Cancer Society office nearest you or write to "Cancer" in care of your local Post Office.

AMERICAN CANCER SOCIETY

AES NEWS

SEVEN-BRANCH MID-WEST REGION FORMED

Delegates of seven midwest AES Branches met in Chicago, January 25 and made forward steps in forming a dynamic Regional group through which to discuss and cooperatively act on area matters of mutual importance, namely Chicago, Milwaukee, St. Joseph Valley, Mississippi Valley; Twin City, Rockford and St. Louis. The last-named sought and obtained admittance to the group at that meeting.

With Leslie L. Diveley of Milwaukee elected Chairman of the body whose momentary name is Mid-West Regional Group, and with Paul Glab of Chicago made Secretary, the group proceeded toward formalization by appointing a seven-man Committee, one man per Branch, to draft bylaws and submit them for group approval prior to channeling to the seven respective Branches for ratification. Dr. Russel E. Harr of Chicago was designated Chairman of this Bylaw Committee. The Group will have its next meeting at the Cincinnati Convention in May.

Present at the organization meeting beside Messrs. Diveley, Harr and Glab were Clyde Kelly (Chicago); Harold D. Wiesner, Louis Rague, Eugene Roth, Ralph Brouwer, Ray J. Dearth and Ralph D. Wysong (St. Joseph Valley); Frank Marshall (Milwaukee); Bernard Nordbloom, L. O. Gilbert, H. C. Lunt and George Parisho (Mississippi Valley); William Geissman (Rockford); Warren Johnson and Robert Tepley (Twin City) and Andrew P. Julius and Robert E. Coulson (St. Louis).

Photograph courtesy of Products Finishing

BRANCH REPRESENTATIVES DISCUSS NEW REGIONAL

Attending the January 25 meeting in Chicago were, left to right around the table, Robert Teply, Twin Cities; Warren Johnson, Twin Cities; Paul Glab, Chicago; Dr. Russel E. Harr, Chicago; Bernhard J. Nordblom, Mississippi Valley; George Parisho, Mississippi Valley; Lloyd O. Gilbert, Mississippi Valley; H. C. Simon, Mississippi Valley; Eugene Roth, St. Joseph Valley; Ralph D. Wysong, St. Joseph Valley; Clyde Kelly, Chicago; Ray J. Dearth, St. Joseph Valley; L. L. Diveley, Milwaukee. Second row, Louis Rague, St. Joseph Valley; John P. Nichols, AES Executive Secretary; Dr. Harold J. Wiesner, St. Joseph Valley; Frank Marshall, Milwaukee; William Geissman, Rockford.

PRESIDENT READYING WEST COAST BRANCH TRIP

Crossing the United States to the Pacific Coast early in April, National President Francis T. Eddy will meet with every West Coast AES Branch. During that two-week Branch tour, Mr. Eddy will make himself available to every Branch possible, and will discuss National and Branch affairs with their leaders and memberships.

Mr. Eddy's tour now in the planning stage will be the third such presidential trek servicing Pacific Coast Branches in the last three years. Then-President Clyde Kelly made such a trip in 1956; then-President Samuel Heiman in the Spring of 1957.

Boston Branch will hold its 22nd Annual Technical Session and Banquet on Saturday, May 3, at the Hotel Statler, Boston.

The speakers at the Technical Session, scheduled for 2 p. m. in the Bay State Room, will be Dr. D. Gardner Foulke, R. E. Pettit and Joseph P. Stella. Dr. Foulke, manager of Electrochemical Development, Hanson-Van Winkle-Munning Co., Matawan, N. J., will speak on "New Advancements in Waste Disposal Treatment." "Etching of Aluminum on Name Plates and Chemical Milling" is the subject chosen by Mr. Pettit, technical advisor to the metal industries department, Diversey Corporation, Chicago, Ill. Mr. Stella, director of research, Promat Division, Poor and Co., Waukegan, Ill., will deliver a paper on "Conversion Coatings and Dyeing of Conversion Coatings."

A special program has been arranged for the Ladies, starting at 1 p. m. The Grand Ballroom will be the scene of the Banquet, Floor Show and Dancing at 7 p. m.

BLUE RIDGE BECOMES AES's 58TH BRANCH

The Blue Ridge Branch, with its membership mainly centered in Virginia and North Carolina, was recently granted a permanent charter by the Executive Board and is now therefore the AES's 58th chartered Branch.

Grown larger since receiving its temporary charter in October 1957, the Blue Ridge Branch is already making its presence felt in AES circles in our Southland, particularly by its collaboration with the Southeastern Branch and the Miami Branch in jointly sponsoring the recent successful two-day Third Annual Technical Session in Atlanta heretofore conducted alone by the dynamic Southeastern Branch.

At a gala Branch meeting in Roanoke, Virginia on Friday, March 28, now being planned, Blue Ridge will be presented with its framed charter and will be welcomed officially into the Society's family of chartered Branches by an installation team of National officers including President Francis T. Eddy and Executive Secretary John P. Nichols. The Branch's preliminary plans include effort to obtain local newspaper and television attention for the event.

CANDIDATES FOR THIRD VICE PRESIDENT

The candidacy for the Society's national office of Third Vice President was announced, in behalf of the two following noted AES members, at the Interim Meeting of the Supreme Society held on January 11, 1958. Expectedly, they will be nominated and vie for election at the Business Meeting of the Supreme Society to be held in Cincinnati, Ohio, Thursday, May 22, 1958.

CHESTER G. BORLET
Technical Director
Grand Rapids Brass Company

A Midwesterner, a graduate of Kent State University with a BS degree in 1935 with further study, at graduate level, at Western Reserve University and at the University of Detroit, Mr. Borlet has since built a solid sales, management and technical record of experience and accomplishment in this industry.

Following service as a sales engineer of the Harshaw Chemical Company, then as a Superintendent of the New York-Ohio Chemical Company, then as manager of sales service at Harshaw, Mr. Borlet became a district manager of the Metal and Thermit Corporation, later occupying a similar post at the McGean Chemical Company. He has been Technical Director, Grand Rapids Brass Co., since 1955.

Supplementing his sound business record with significant AES service during that same span, Mr. Borlet has actively been affiliated with three Branches, namely Detroit, Los Angeles and now Grand Rapids, with high quality performance in each. Apart from Branch positions of leadership held, he has represented both the Los Angeles and the Grand Rapids Branch as a Delegate.

Active, moreover, in the AES Research Program as a member of the Project 15 Committee, he is additionally, a stalwart of the Electrochemical Society and of the ASTM B-8 Committee. While in Los Angeles, he taught two classes in electroplating yearly.

GEORGE W. CAVANAUGH
Manager of Inorganic Chemistry
Metals and Processes Laboratory
General Electric Company

A native of Syracuse, New York, Mr. Cavanaugh was graduated from Notre Dame University with a PhB degree in 1926. His later graduate studies in the fields of metallurgy and electro-chemistry occurred at St. Bonaventure College, St. Bernard's Seminary and at Syracuse University.

Following three years as a feature writer on the Cleveland News, Mr. Cavanaugh spent ten full years in the metal coating business in Syracuse. He entered the employ of the General Electric Company in 1943 and advanced from metallurgist, welding engineer, then chief chemist to his present position as manager of Inorganic Chemistry in his company's Materials and Processes Laboratory at Electronics Park, Syracuse.

A long-time member of the AES, Mr. Cavanaugh has a noteworthy record of Society service. He was last year's Chairman of the Society's Law Committee and served as the National Parliamentarian of the Supreme Society. His broad interest and study of parliamentary law since his college days has earned him notice as an authority on the subject. His book, "Simplified Parliamentary Practice," has received acclaim. A member of his company's Speakers' Bureau, he is in demand as a speaker on parliamentary practice by many organizations including AES Branches.

CONVENTION INFORMATION MAILED

In behalf of the 45th Annual Convention Committee, stuffed envelopes were mailed by National Headquarters on January 24, 1958 addressed to every Branch Member, Member-at-Large and Sustaining Member of the American Electroplaters' Society, wherever domiciled here and abroad, containing:

1. Letter from Convention Chairman Charles Wise.
2. Hotel Reservation Form.
3. A leaflet titled, "For the Ladies," describing the Ladies' Program.
4. A Return Card via which to send in questions for the Thursday morning (May 22) panel on practical plating problems, titled "Stump the Experts."

A Hotel Reservation Form is also provided in this issue of PLATING on page 278.

GAUL DIVIDED IN THREE PARTS

Three Branch Annual Meetings occurred on the same recent February Saturday, namely the Annual Educational Session conducted by the Southeastern, Miami and Blue Ridge Branches in Atlanta, Georgia; the Annual Meeting of the Cleveland Branch in that municipality and the Annual Meeting of the Grand Rapids Branch in that Michigan community.

So as to accommodate each, National Officers teamed thus: President Francis T. Eddy and Past President Samuel Heiman journeyed to Atlanta; Third Vice President W. Andrew Wesley and Executive Secretary John P. Nichols visited Cleveland and Second Vice President Ralph D. Wysong served as Technical Sessions Chairman at Grand Rapids. First Vice President Herberth E. Head had to forego the Atlanta trip due to illness.

BALLOT COUNTING COMMITTEE IN ACTION
The Ballot Counting Committee appointed by National President Francis T. Eddy in action at National Headquarters, February 5. Left to right: William A. Grigat, Chairman Robert A. Ehrhardt, Gustav Bittrich.

CONSTITUTION AND BYLAWS AMENDMENT ENACTED

With 145 of the 169 accredited Delegates composing the Supreme Society, highest governing council of the American Electroplaters' Society, Inc. (AES), voting by signed letter ballot, the AES's Constitution and its Bylaws have respectively been altered so as hereafter to enable the amendment of these respective instruments by 2/3rds votes *cast* by Delegates by roll call vote or letter ballot as per Robert's "Rules of Order" instead of by 2/3rds votes of *ALL* Delegates as heretofore provided. Requiring 113 votes to enact (being 2/3rds of all Accredited Delegates), the Constitutional amendment was adopted by a signed vote of 125 "ayes" to 20 "nays"; the Bylaw amendment won by signed 124 "ayes" vs. 20 "nays".

The proposal for such Constitutional and Bylaw amendment was conceived early last Autumn by the Law Committee and was espoused and championed by the Executive Board at its September 21, 1957 meeting. Society wide notice was given by National President Francis T. Eddy in the November issue of PLATING Magazine. The letter ballot, together with full explanatory data and return envelope, was issued to all 169 accredited Delegates on December 5, 1957 with deadline for all returns of this so-called "Letter Ballot No. 1" set as January 1, 1958. Three "follow-ups" were made so as to ensure every opportunity to Delegates to ballot on the proposal. As of February 5, 1958, the sealed ballot envelopes of 145 accredited Delegates were on hand at National Headquarters.

These 145 sealed envelopes containing signed letter ballots were delivered for unsealing and count on February 5, 1958 to an official committee appointed by National President Eddy for this purpose by instruction of the Executive Board. Composed of Chairman Robert A. Ehrhardt (Research Committee Chairman); William A. Grigat (Newark Branch President) and Gustav Bittrich (Newark First Vice President), the count certified by this Committee thereby constituting enactment accompanies this report.

After unsealing, count and recording by the foregoing Committee, National Headquarters assumed custodianship of these 145 signed ballots and, consequently, they are now on permanent file at the National Office.

Supreme Society Letter Ballot No. 1 (Dated 12/5/57)	Number of Delegates Accredited	Number Voted Letter Ballot No. 1	Vote Result			
			Constitutional Amendment		Bylaw Amendment	
			Aye	Nay	Aye	Nay
Adelaide	3	2	2		2	
Allentown-Reading	3	2		2		2
Baltimore-Washington	3	3	3		3	
Boston	3	3	3		3	
Bridgeport	3	3	2	1	2	1
British Columbia	3	1	1		1	
Buffalo	3	1		1		1
Capitol District	3	2	2		2	
Central Michigan	3	3	3		3	
Chicago	3	3	3		3	
Cincinnati	3	2	2		2	
Cleveland	3	3	3		3	
Columbus	3	3	3		3	
Dallas-Fort Worth	3	2	2		1	
Dayton	3	3	3		3	
Detroit	3	3	3		3	
Grand Rapids	3	3	3		3	
Hamilton	3	3	3		3	
Hartford	3	3		3		3
Houston	2	2	2		2	
Indianapolis	3	3	3		3	
Kansas City	3	3	3		3	
Lancaster	3	3	2	1	2	1
Los Angeles	3	3	3		3	
Louisville	3	3	3		3	
Melbourne	3					
Miami	3	3	3		3	
Milwaukee	3	3	3		3	
Mississippi Valley	3	1	1		1	
Mohawk Valley	3	3	2	1	2	1
Montreal	3	3	3		3	
Newark	3	3	3		3	
New Haven	3	3	3		3	
New York	3	3	1	2	1	2
Philadelphia	3	3	3		3	
Pittsburgh	3	3	2	1	2	1
Portland	3	1	1		1	
Providence-Attleboro	3	2	2		2	
Rochester	3	3	3		3	
Rockford	3	3	2	1	2	1
Saginaw Valley	3	2	2		2	
St. Joseph Valley	3	3	3		3	
St. Louis	3	3	3		3	
San Antonio	3	3	3		3	
San Francisco	2	2	2		2	
Seattle-Puget Sound	3	1	1		1	
Southeastern	3	3		3		3
Southern Tier	3	2	2		1	1
Springfield	3	3	2	1	2	1
Sydney	3	3	2	1	3	
Syracuse	3	2	1	1	1	1
Toledo	3	2	1	1	1	1
Toronto	3	3	3		3	
Twin City	3	2	2		2	
Waterbury	3	3	3		3	
Western Ontario	3	3	3		3	
Wichita	3	3	3		3	
Total	169	145	125	20	124	20

If you have not already made your Cincinnati Convention hotel reservations a form is provided for your convenience on page 278.

PINNER AWARDED FIRST "POT"
Present when Past President Pinner received the first "pot" in 1946 were: (left to right), George Gehling, William Blum, Ken Huston, Frank Mesle, Walter Pinner, Fred Fulforth, Ken Graham and Tom Slattery.

ORDER OF THE POT: ITS SAGA

by
Past President Kenneth M. Huston

Traditionally, each outgoing National President of the AES receives the famous silver-plated and gold-lined "pot" of the Order of Past Presidents at a gala ceremonial dinner conducted by the Baltimore-Washington Branch in April of the President's fading year of administration. As an item of wide membership interest, here Past President Kenneth M. Huston sketches the biographical background of that cherished traditional award.

The AES's Order of the Pot (OOP) was formally organized with Walter L. Pinner as Pot Wielder and Ken Huston as Pot-scriber at the Milwaukee Convention in 1949. It was the outgrowth of two events.

Prior to the AES Constitution revisions at the 1949 Atlantic City Convention, the Law Committee consisted of all Past Presidents. A formal Law Committee was established by the new Constitution thereby leaving the Past Presidents without formal organization.

The second important event was Tom Slattery's presentation of a "pot" to Walter Pinner upon the occasion of his visit as President of the AES to the Baltimore-Washington Branch in 1946. Pinner had related to his Third Vice President, Ken Huston, how he had played a practical joke upon one of his supervisors at the Danville, (Ill.) Manhattan Project. This resulted in a "fur lined pot" being presented to the boss by an unsuspecting secretary at the annual Christmas Party. Huston believed a humorous incident could be added to the evening's entertainment by giving Pinner a plated pot. It was a silver and cadmium plated echo box (used to check aviation radar equipment in World War II) with a gold plated handle. It represented a time-consuming inspection operation which had been shortened by Huston's application of better plating practices while a finish engineer at the Western Electric Company.

From these beginnings, the Baltimore-Washington Branch thereafter presented similar pots to Presidents Savage (1947), Huston (1948), Johnston (1949) and Logozzo (1950). Logozzo's was the last of the original aluminum pots. Each "pot" that has since been presented by the Baltimore-Washington Branch to the retiring National President has been of copper. Holders of the original aluminum pots are considered today as Charter Members of the Order.

The formal organization took place in the Executive Secretary's rooms at the Hotel Schroeder in Milwaukee on June 27, 1949 with Past Presidents Pinner, Savage, Huston and Johnston present. Constitution and Bylaws were prepared by Huston and submitted in November 1949. A Certificate of Membership with the slogan "At Least We Have a Pot" was prepared in 1950. Three types of members were recognized: (1) Those receiving pots from the Baltimore-Washington Branch; (2) Those who talked their Branch into presenting them one; (3) Stinkers who prepare their own.

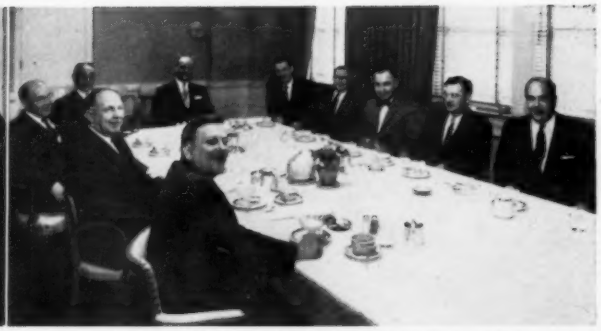
The Order's first dinner meeting was held on July 31, 1951 at Buffalo's Hotel Statler. It was attended by Past Presidents Pinner, Johnston, Logozzo and Neill and members of the Executive Board.

The membership was opened for one year to all Past Presidents at the June 18, 1952 meeting in Chicago. Those joining during that period were Past Presidents E. J. Musick (President in 1926), F. C. Mesle (1927), C. L. Van Derau (1933, 1934), H. A. Gilbertson (1935), T. F. Slattery (1936), E. S. Thompson (1937), A. B. Wilson (1938), W. M. Phillips (1939), Frederick Fulforth (1941), E. T. Candee (1942), C. C. Conley (1943), George J. Wagner (1944), M. R. Caldwell (1945). This represented all the then living Past Presidents.

The first large dinner meeting was held at Philadelphia's Hotel Benjamin Franklin in 1953. Past Presidents Neill, Johnston, Wagner, Huston, Logozzo, MacStoker, Caldwell, Gilbertson, Pinner, Nixon and Phillips were present at this meeting. Meetings since that time have been dinner meetings held on the Monday evening of the Annual Convention. All have been well attended.

It became evident in 1954 that the name "Order of the Pot" made it difficult to hold serious recognition of its object of "a group of experienced leaders to whom the Executive Board and others may turn for counsel in furtherance of the aims of The American Electroplaters' Society." A letter ballot vote of Past Presidents resulted that year in change of name from "Order of the Pot" to "Order of Past Presidents." The Bylaws were revised at the same time. Currently at the Order's helm are Past President Walter L. Pinner as President and Past President Samuel S. Johnston as Secretary-Treasurer. Members not already named foregoing include Past Presidents G. P. Swift (1954), R. A. Schaefer (1955), Clyde Kelly (1956) and S. Heiman (1957).

Ed. Note: The Order of Past Presidents will have a business meeting at the 45th Annual Convention, Hotel Sheraton-Gibson, Cincinnati, on Monday afternoon, May 19, 1958 starting about 4:30 p.m. and will stage its Annual Dinner Meeting that same evening. Meantime, National President Francis T. Eddy will receive his "pot" from the Baltimore-Washington Branch at a traditional Branch ceremony in Baltimore on April 12, 1958.



CLEVELAND BRANCH DONATES $500 TO AES RESEARCH PROGRAM

Materially exemplifying its dedication to the AES Research Program being conducted at various American and Canadian universities and foundations to enrich technical and scientific knowledge in electroplating, metal finishing and allied arts, the Cleveland Branch voted from its treasury and contributed to the AES Research Fund, the sum of $500—that amount being, of course, over and above the "dollar per Branch member for Research" that is earmarked thus in the per-capita taxes paid annually by each AES Branch member.

Above AES Past President Ralph A. Schaefer presenting the Branch's $500 check to Third Vice President W. A. Wesley. Left to right, John P. Nichols, Secretary-Treasurer of the AES Research Program; Branch President Morton Van Loan; Dr. Wesley; Dr. Schaefer and Branch Secretary-Treasurer Robert I. Peters.

Other Branches that have also made special Branch contribution to the AES Research Fund this fiscal year include Central Michigan Toronto and Western Ontario.

SPEAKERS LUNCHEON AT CLEVELAND'S ANNUAL EDUCATIONAL SESSIONS

Featuring two noted speakers, a sizable turnout, followed by a sumptuous dinner-dance, the bourgeoning Cleveland Branch conducted its successful Annual Educational Session, Dinner and Dance at the Hotel Carter of that city Saturday, February 15. Richard C. Barrett of the Barrett Chemical Products Co. presented a well-received talk on "New Aspects from Nickel Plating from the Sulfamate Bath" and Myron Diggin of Hanson-Van Winkle-Munning Company covered "Recent Advances in Bright Nickel Plating."

Above left to right at the Speakers' Lunch; R. C. Barrett; Technical Sessions Chairman W. A. Wesley; Arthur H. DuRose; National Executive Secretary John P. Nichols; Branch President Morton Van Loan; Branch Secretary-Treasurer Robert I. Peters; Branch First Vice President Jack B. Winters; Branch Librarian Joseph E. Rhodes; AES Past President Ralph A. Schaefer and Myron C. Diggin.

In the absence of Henry J. Sedusky, now in Brazil on business, Paul Cadek served as Acting General Chairman of the Dinner-Dance with John Bohovic as Entertainment Chairman. Handsome umbrellas, besides orchid corsages, were the ladies' favors.

FIRST MISSISSIPPI VALLEY ANNUAL TECHNICAL SESSION

The Mississippi Valley Branch will hold its First Annual Technical Session and Banquet at Johnny Hartman's Restaurant, Davenport, Iowa, on April 12.

Three technical papers will be presented at the afternoon session. Ronald Dow of Metal and Thermit Corp. will talk on "Survey of Modern Chrome Plating." A representative of Allied Research Products, Inc., has chosen the subject "Chromate Conversion Coating for Non-Ferrous Metals." Harris Beck of Glidden Company will talk on "Causes and Cures of Some Conamon Defects in Paint Film."

The ladies will be treated to a fashion show starting at 2:30 p.m. A cocktail and social hour will start at 6 p.m. The filet mignon dinner will be followed by nite club style entertainment.

The new AES Educational Committee, in addressing its attention to the subject of electroplating courses, is interested in exploring the extent of membership interest in organic coating courses. Members' views on the subject would be welcomed. Write yours to Dr. John Kane, Chief Chemist, Canadian Arsenals, Ltd., P. O. Box 490, Quebec, P. Q. Canada.

BANNER ATTENDANCE EXPECTED AT NEW ENGLAND REGIONAL

On Saturday, April 12, the 19th Annual New England Regional Meeting will take place at the Statler Hotel, Hartford, Connecticut. The New England Regional is composed of the AES Branches in Springfield, Mass., and Waterbury, Hartford, Bridgeport and New Haven, Conn.

The Educational Chairman for the meeting is Frank Tirendi, Waterbury Branch, and Isidore Cross, also of Waterbury, is Technical Chairman. An educational motion picture, "The Finishing Touch," will be shown prior to the introduction of the speakers.

Henry A. Strow, president of True Brite Chemical Products Co., has chosen for his subject "Stripping of Electroplated Coatings." This paper will cover the various general methods of removing electroplated coatings from various basis metals. Particular attention will be given to the newer methods using cyanide with oxidizing agents.

Dr. W. Andrew Wesley, manager of International Nickel Co.'s Research Laboratory will lecture on "Nickel-Chromium vs. the Atmosphere." In his lecture, Dr. Wesley will review the corrosive behavior of nickel and chromium foils separated from the basis metal.

The ladies will be entertained during the afternoon while the men are attending the Educational Session. They will join the men in the evening for the banquet and dancing. Floyd Tatum, Bridgeport Branch, is chairman of the Entertainment Committee.

ROCKFORD ANNUAL FEATURES THREE TECHNICAL SPEAKERS

The Rockford Branch of the American Electroplaters' Society will hold its Annual Banquet and Educational Session on Saturday afternooon and evening, March 15, at the Faust Hotel, Rockford, Ill.

Albert Overbey of the National Lock Company, Rockford, general chairman for the Annual Session, has arranged for a panel of three speakers, each prominent in the field of electroplating, to address the afternoon Educational Session. The speakers and their affiliations are: Dr. Russel E. Harr, Process Engineer for Western Electric Company and chairman of the AES Scientific Achievement Awards Committee and also president of the Chicago Branch, AES. Dr. Harr's topic will be, "Thickness Measurements of Electrodeposited Coatings." Edward J. Bromstead, associated with the Midland Industrial Finishes Company of Waukegan, Illinois, will speak on, "Modern Organic Finishes for Metals." Dr. W. Andrew Wesley is Third Vice President of the National Society of AES, and is Manager of the Research Laboratory for the International Nickel Company. Dr. Wesley's topic will be, "What We Do and Do Not Know About Nickel-Chromium Coatings."

William Geissman, president of the Rockford Branch of AES has arranged for Clyde Kelly, Past President of the National Society of AES, to be moderator for the afternoon educational session.

KICKOFF OF NAMF MEMBERSHIP DRIVE

Last minute instructions to divisional leaders given by "Coach" A. T. Leonard, extreme right, Minneapolis, at Chicago's Conrad Hilton on January 25. Left to right, George W. Taylor, Atlanta; Edward N. Marlette, Buffalo; Stephen P. Palisin, Cleveland; Webster B. Knight, Detroit; Henry J. Siegel, St. Louis; Harold W. Baker, Chicago; Mariano Ranno, New York; Drive Chairman Leonard. The drive ends March 31.

WHITENECK NEW PRESIDENT OF NACE

L. L. Whiteneck, vice president and director of materials research for Plicoflex, Incorporated, Los Angeles, California has been elected president of the National Association of Corrosion Engineers. He will take office, with others, on the last day of the March 17–21, Annual Conference and Exhibition in San Francisco.

Also elected were Hugh P. Godard, head of the Chemical Division, Aluminum Laboratories, Limited, Kingston, Ontario, Canada, vice president and A. L. Stegner, corrosion engineer for Tennessee Gas Transmission Company, Houston, re-elected for a second term as treasurer.

Mr. Whiteneck, currently vice president of NACE, has been active in NACE affairs on the West Coast for several years.

Dr. Godard, whose principal work for the past 12 years has been in connection with the corrosion reactions of aluminum, has been an NACE director and a member of the abstract and technical committees. He is a former chairman of the NACE Intersociety Corrosion Committee and has been a member of the Canadian Associate Committee on Corrosion Research since its inception in 1947, among other organizations in Canada.

A. L. Stegner, treasurer, belongs to several organizations in the petroleum industry concerned with corrosion control. He has been active in NACE as a director and in other capacities.

The 1957 NACE Willis Rodney Whitney Award will be given to T. P. Hoar, lecturer in metallurgy, Cambridge University, England. The Frank Newman Speller Award will go to Robert J. Kuhn, for more than 30 years corrosion engineer for New Orleans Public Service, Incorporated, New Orleans.

The awards will be presented during the annual banquet Wednesday, March 19 at San Francisco.

Dr. Hoar, whose research work on fundamental causes of corrosion began in 1930 under Dr. Ulick R. Evans (who received the 1948 NACE Whitney Award) is a consultant on corrosion matters to several large industrial firms. His work includes a series of projects for the International Tin Research and Development Council on corrosion of steel, tin and tinplate. He also worked during World War II for the British armed services and for industrial concerns on corrosion control matters.

Mr. Kuhn, among the early members of NACE, has been occupied since his graduation from Tulane University in 1923 with the corrosion problems of New Orleans Public Service, Incorporated.

The technical program for the 14th Annual Conference and Exhibition of the NACE is the most diversified ever planned by the association. With more than 85 papers scheduled in 16 symposia, four discussion sessions and three educational lectures, the program also is NACE's largest. More than 80 meetings of technical committees also will be held during the conference.

AINSWORTH NOW ASA TECHNICAL DIRECTOR

Cyril Ainsworth, technical director of the American Standards Association, New York, has been appointed deputy managing director of the association.

J. W. McNair, assistant technical director, and for many years in charge of the electrical and photographic work of the association, will succeed Mr. Ainsworth as technical director. Mr. McNair was also appointed assistant secretary of the organization.

Both men have been with the American Standards Association 28 years.

Vice Admiral George F. Hussey Jr., USN (ret.) was re-elected managing director by the ASA Board of Directors.

Mr. Ainsworth will continue to serve as assistant secretary.

Since Mr. Ainsworth and Mr. McNair have been with the ASA the number of American Standards has grown from 176 to over 1700.

BRENNER IS RICHARDS LECTURER AT ELECTRO-CHEMICAL MEETING

The Electrochemical Society will hold a five day meeting at the Hotel Statler, New York City, during the week of April 27. The five divisions scheduling technical sessions are: Electric Insulation, Electronics, Electrothermics and Metallurgy, Industrial Electrolytic, Theoretical Electrochemical.

Highlights of the meeting will be symposia on stress corrosion cracking of stainless steels, high purity metals, semiconductor materials, fused salt electrolysis, ceramics, plastic insulation, printed circuits, and electrokinetic phenomena.

Dr. Abner Brenner, National Bureau of Standards, will deliver the Richards Memorial Lecture on the subject "Electrolysis in Nonaqueous Solutions."

PLATERS REPRESENTED AT SAFETY CONFERENCE

President Eisenhower has designated March 25 to 27 as the dates for the 10th Anniversary Conference on Occupational Safety, to be held in Washington, D. C.

Around the theme—Safety Conserves Manpower—Manpower Builds the Future—the conference will consider methods of safeguarding our changing labor force against the emerging technological hazards of the Space Age.

The President will greet delegates from all over the country and Secretary of Labor James P. Michell will address them as will other leading figures of industry and labor. Job platers will be represented at the conference by P. Peter Kovatis, executive secretary of the National Association of Metal Finishers. Speakers and workshops will deal with many important aspects of safety.

ASME MEETINGS HEAVIEST EVER SCHEDULED

The heaviest schedule of national meetings and conferences in its history has been announced by The American Society of Mechanical Engineers. The Society will sponsor or co-sponsor twenty-four major events at locations throughout the country during 1958 dealing with dozens of technical subjects. All ASME meetings are open to interested persons, whether members of the society or not.

In addition to its own meetings, ASME will take part in the 1958 Nuclear Congress to be coordinated by Engineers Joint Council in Chicago, March 16–22, and in the Third U. S. Congress of Theoretical and Applied Mechanics, June 11–14, at Providence, Rhode Island.

The announcement noted a trend toward increased emphasis on conferences dealing with a particular field of engineering "as a result of the increased complexity of subject matter in virtually all fields of engineering."

Typical of the trend toward specialized meetings are four new conferences to be sponsored by units of the society during 1958 including one in Pittsburgh, April 14–15, under the newly formed Maintenance and Plant Engineering group of ASME. Other conferences that will be held for the first time this year are Production Engineering, Worcester, Mass., April 10; Materials Handling, Cleveland, Ohio, June 9–12 and Process Industries, Buffalo, New York, September 15–17.

ZINC RESEARCH PROGRAM UNDERWAY

In a paper presented Feb. 6 before the National Western Mining Conference, John L. Kimberley, executive vice president of the American Zinc Institute, pointed to a program presently underway which is aimed at the expansion of existing markets as well as the discovery of new ones through applied and fundamental research. It will include a broad placement of projects with research centers, universities and engineering schools.

Mr. Kimberley described some of American Zinc Institute's current research activities commissioned on behalf of the zinc industry. These include the use of zinc anodes for cathodic protection of steel underwater and underground; the finishing of zinc die castings at Battelle Memorial Institute, Columbus, Ohio; promotion and collaborative research in the laboratories of zinc oxide producers on zinc pigments for paints; research on wet storage stain at Southern Research Institute, Birmingham, Alabama; plus the examination of such phenomena as superior heat reflectivity of galvanized sheet painted white or whitewashed, comparison of aluminum-coated steel sheet against galvanized sheet, and paint adherence on galvanized surfaces.

PLATERS ATTEND MANAGEMENT SEMINAR IN CHICAGO

On January 25, nearly 100 job and captive shop electroplaters heard Jerome Kiesling, Associated Business Consultants, Chicago when he addressed a combined meeting of the National Association of Metal Finishers and the Chicago Electro-Platers Institute.

MASTERS' BANQUET AT HOTEL ASTOR

The Masters' Electro-Plating Association of New York will hold its 40th Annual Banquet at the Astor Hotel, New York City, on Saturday, June 14, 1958. This is the outstanding event of the year in that industry. Suppliers, job platers and their friends from all over the U.S.A. are expected to be in attendance.

The association was formed in 1918 with a few hardy pioneers. It has now grown to almost 100 members in the New York Metropolitan area. The Association has strived in every way to raise the technical, business and ethical standards of the industry.

This year A. Galfunt, Hudson Chromium Co., is the banquet chairman. Mariano Ranno of the Imperial Plating Co. is chairman of the association, L. A. Kornblum, Kings Electro Plating Co., is vice chairman and Frank Kaiser of Long Island Mechanical Plating Co. is treasurer. A.T. Marinaro is the executive secretary with offices at 59 East Fourth St. New York 3, N.Y.

The cocktail hour will start at 6:30 p. m., followed by the banquet, dancing and entertainment. Subscription is $25.00 per person—dress is optional.

NAMF DRIVES FOR NEW MEMBERS

"The job shop plating industry must unite if it is to realize the many benefits that come from concerted, organized action," National Association of Metal Finishers drive chairman A. T. Leonard told some hundred shop owners and operators at the Conrad Hilton Hotel, Chicago, January 25 according to a release from the NAMF.

More than a dozen states were represented as divisional chairmen, members and prospects took part in a membership drive rally co-sponsored by the NAMF and its Chicago affiliate, the Chicago Electro-Platers Institute.

A highlight of the kickoff meeting was a discussion on "What Constitutes a Profit," conducted by Jerome Kiesling, Associated Business Consultants, Chicago. Mr. Kiesling reviewed operating and cost ratios. A lively discussion revealed the expected keen interest in furthering cost reductions and the importance of an industry-wide survey of cost ratios.

The afternoon and evening were devoted to the 46th annual educational session and banquet of the Chicago Branch, AES.

MFSA CONVENTION ACTIVITIES ANNOUNCED

The Annual Convention of the Metal Finishing Suppliers' Association will be held at the Sheraton-Gibson Hotel in Cincinnati, May 18 to 20.

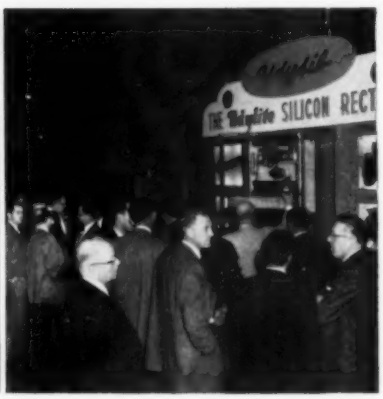
The trustees of the association will meet on Sunday afternoon, May 18. The following day at noon, a luncheon will precede the annual meeting. MFSA will hold its customary open house on Monday night in the Sheraton-Gibson Roof Garden, starting at 9 o'clock. Music will be supplied by Barney Rapp's Band. A buffet will be served.

Golfers will tee-off at 8:30 a. m. on Tuesday to start the tournament on the two 18-hole courses of the Kenwood Country Club.

INDUSTRIAL WASTE MEETING AT ATLANTIC CITY

The 43rd annual meeting of the New Jersey Sewage and Industrial Waste Association will be held March 12 to 14 at the Hotel Traymore in Atlantic City. Ten technical papers will be delivered, many of them of interest to electroplaters. Among these are: "Disposal of Cyanide Wastes" by R. J. Baber and A. E. Griffin of Wallace and Tiernan; "Scheme of Analysis of Iron, Chromium, Copper and Nickel Metals by Photometric Procedures" by Edward R. Grich of Edward R. Grich, Inc.; Basic Data for Chemical Wastes Disposal by Robert W. Haywood Jr., E. I. DuPont de Nemours Co. These particular papers will be delivered at the Industrial Waste Symposium on Wednesday afternoon, March 12.

INDUSTRY NEWS



In a novel presentation, Udylite Corporation introduced its new silicon rectifier, Udy-Sil, at a luncheon to AES Chicago Branch and guests, prior to the Branch's 46th Annual Education Session at the Conrad Hilton Hotel, January 25. Udy-Sil literally spoke for itself. As each of the large photos, flanking the silicon rectifier (center, above) was lighted, the voice of Udy-Sil was heard describing the component shown. (Left) The Udylite reception preceding the luncheon. (Right) Interested group inspecting the rectifier at close range.

MEXICAN SUBSIDIARY FORMED BY ASARCO

C. T. McDonald

A new Mexican subsidiary, Enthone de Mexico S. A., has been formed by American Smelting and Refining Co. to produce and sell the Enthone line of metal finishing products in Mexico. The new enterprise has been set up, according to Asarco officers, in recognition of the continuing growth of the metal finishing industries in Mexico and the developing need of these industries for a domestic source of supply of metal-finishing chemicals.

Production plans call for the manufacture of special chemicals to fulfill the particular needs of Mexican metal finishers. Enthone de Mexico S. A. will also supply metal finishing equipment.

Camilo Torres McDonald, founder and president of the S. M. G., the Mexican counterpart of the American Electroplaters' Society, has been named general manager of the new Asarco subsidiary. Mr. Torres is a graduate of the School of Engineering at Texas A. & M. and has had broad experience in the metal finishing business in the United States and Mexico.

Enthone de Mexico will headquarter at Avenida Juarez 127, Desp. 11, Mexico 1, D. F., Mexico.

LARGEST HYDROGEN SULFIDE PLANT

Plans for the largest synthetic hydrogen sulfide plant ever built—to be a key unit in the $119,000,000 nickel-cobalt project being constructed in Cuba and in Louisiana by Cuban American Nickel Co., a subsidiary of Freeport Sulphur Co.—have been announced.

Cuban American Nickel has authorized the engineering and equipment of an automatic plant to produce 60 tons per day of liquid hydrogen sulfide for its ore-concentrating facilities at Moa Bay, Oriente, Cuba. This, the first large-scale hydrogen sulfide plant ever used in ore processing, will be part of a process developed by Cuban American to produce nickel from limonite ore.

Cuban American's nickel refinery will be at Port Nickel, La., near New Orleans. Its capacity will be 50,000,000 lb a year of nickel and 4,400,000 lb a year of cobalt when production begins in mid-1959. Limonite ore averaging 1.35 per cent nickel and 0.14 per cent cobalt will be mined near the Cuban plant at Moa Bay, where the ore will be concentrated by chemical means to produce a nickel-cobalt sulfide, to be shipped to the Port Nickel refinery.

CASALBI APPOINTS GLOBE REPRESENTATIVE

Casalbi Company, Jackson, Michigan, announces the appointment of Clemtex, Inc., Houston, Texas, to handle the sale of their Globe barrel finishing equipment and supplies. Clemtex employs six sales engineers who will handle direct sales in the state of Texas. Clemtex will also cover Globe sales through their dealer organizations in Oklahoma, Arkansas, West Tennessee, Louisiana and Mississippi.

AMERICAN PLATINUM EXPANDS IN NEW ENGLAND

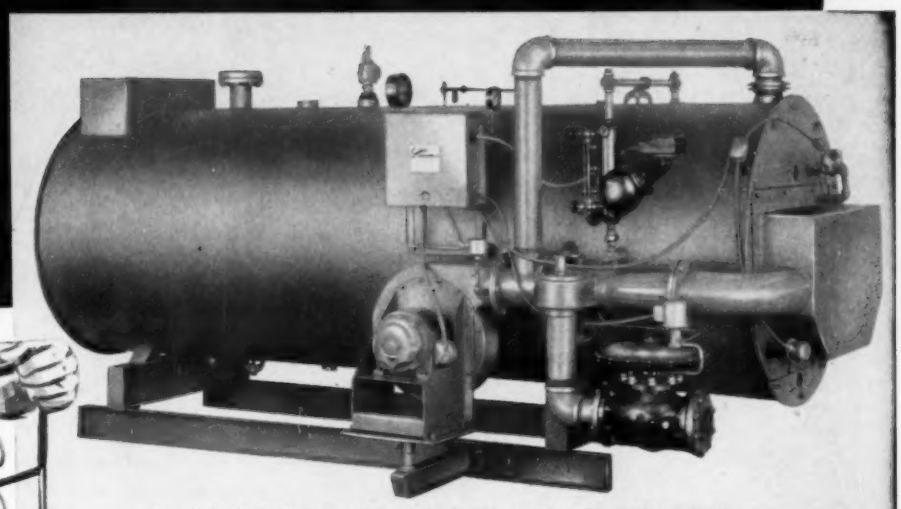
The American Platinum and Silver Division of Englehard Industries, Inc., has bolstered its New England operations by more than doubling the size of its plant and warehouse in Providence, R. I.

New facilities include a vault three times as large as the former one, enabling the plant to stock more items.

A scale with a capacity of 32,000 troy ounces, a new blanking shears, and a gang slitter for cutting precious metals to exact widths also are among the new equipment.

The new installation was shown to 150 customers and representatives of jewelry associations at an open house. W. J. Wagnitz, vice president and manager; Joseph Nickerson, vice president; and R. H. Jones, silver sales manager, attended from Newark for the occasion.

AT LAST A BOILER DESIGNED FOR THE PLATER!



Model 105 Sellers Closed Combustion Chamber Boiler

NOW—No more foul fumes because of incomplete combustion due to back draft through boiler created by exhaust fans or poor draft conditions.

SELLERS solves this problem with the improved design, closed combustion chamber boiler. All air for combustion, both primary and secondary, is pushed through the boiler under positive pressure, independent of partial vacuum in the building and independent of any back draft on the chimney (of course, products of combustion must be removed from building).

A positive pressure blower supplies air under pressure which is mixed with the gas and passed to burners in the completely closed combustion chamber; to complete combustion, secondary air is fed into the closed chamber under positive pressure (many times greater than the vacuum in the building). By this method of securing positive complete combustion, burned gases are pushed through the boiler and FOUL FUMES ARE ELIMINATED.

Read about these Extra Features in Catalog 5206

1. NOW—SCHOOL ROOM QUIET
2. ALL-ON, ALL-OFF RUNNER PILOTS
3. NO OPEN FLAME
4. WORKS ON LOW GAS PRESSURE
5. POSITIVE PRESSURE BLOWER OVERCOMES BUILDING VACUUM AND CHIMNEY BACK DRAFT
6. SIZES FROM 15 HP TO 200 HP

Sellers ENGINEERING CO.

4876 N. CLARK STREET CHICAGO, ILL.

Blast Heaters • Immersion Automatic Water Heaters • Combustion Units • Industrial Gas Burners
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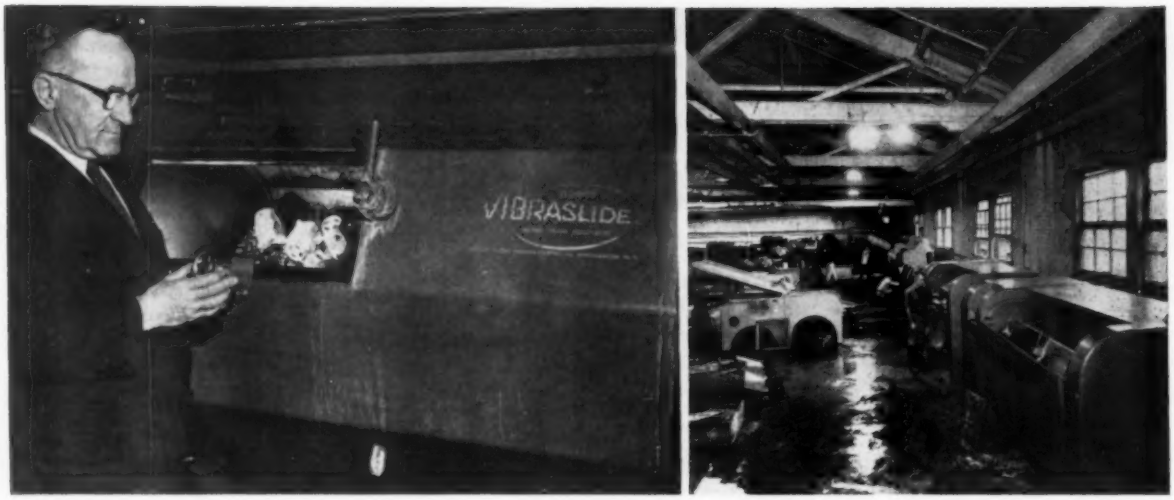
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 330.



(Left) P. E. Kirchartz of Metal Finish, Inc., Newark, inspects a complex part after a trial run using the new vibratory method of barrel finishing. Using this new method, inside diameters of parts similar to the one he is holding can be barrel finished at the same time the outer surfaces are being processed. (Right) This installation of two vibratory barrels (foreground) in the Metal Finish plant can replace the production capacities of eight of the standard barrels in the background.

VIBRATING BARREL INTRODUCED BY 3M

A new barrel finishing system said to cut time cycles up to 70 per cent and for the first time make it possible to barrel finish inside diameters was recently unveiled at the plant of Metal Finish, Inc., Newark, one of the 3M Honite distributors which will handle the new barrel.

Based on a machine called the Vibraslide, the system combines the principles of rotation and vibration to produce rapid results during cut-down cycles; and is capable of utilizing either principle alone to achieve unique as well as standard results.

Many parts that were previously not adaptable to barrel finishing because of material or design can be done in the vibrating barrel, according to a spokesman for Minnesota Mining and Manufacturing Co., St. Paul, which has exclusive distribution of the Vibraslide.

Truss rings, for which barrel finishing procedures previously required 40 hours in a standard barrel, are being processed in the new machine in two hours—and finishes are comparable to those produced by the slower time cycle.

Jet blades, previously barrel finished in 40 hours running time, are now being finished in 16 hours using the vibratory system.

In addition to faster finishing time, another important feature is that up to three times the number of parts normally run in a standard barrel can be finished at the same time, due to its slower rotation and vibrating action.

The machine resembles a standard octagonal barrel, except that the frame is necessarily larger (67½ by 50 in. by 8 ft) to accomodate the vibratory system.

The vibratory barrel will operate at rotating speeds from four to 20 rpm. The speed of the vibrator is fixed at 2,300 cycles per minute, and both ends of the barrel are synchronized with timing belts so that vibration is uniform throughout the media.

The entire mechanism is rubber-mounted to hold frame vibration to a minimum. While securing of machinery is recommended, the Vibraslide machines at Metal Finish, were not lagged, and no creeping was evident.

The speed of the new barrel finishing system is a result of opposing forces within the barrel once the vibratory system is in motion, according to P. E. Kirchartz of Metal Finish, who was a consultant in development of the barrel.

Mr. Kirchartz noted that the system is particularly effective as a cut-down tool when the vibratory mechanism is in operation, and that with the vibration turned off, the barrel becomes a standard barrel for finishing.

The rapid rate of stock removal even with the barrel rotating at four rpm makes it possible to process delicate or large parts which previously had to be fixtured to prevent breaking or other damage.

GRAND RAPIDS PLANTS BOUGHT BY NATIONAL MALLEABLE

National Malleable and Steel Castings Co., Cleveland, has acquired the Grand Rapids Plating Co. and its subsidiary, Grand Rapids Die Casting Co.

National's president, Cleve H. Pomeroy, said that the two plants employ about 250 people in Grand Rapids, Michigan. The purchase contract was made with executors of the estate of Mrs. Raymond W. Brach, whose husband founded both companies.

"These are excellently operated companies," Mr. Pomeroy said, "with good management, fine manufacturing layouts, and high morale. We don't foresee the need for any changes in their operations or personnel. Many of our own customers use the sort of parts made at Grand Rapids, and we do hope to be able to expand the companies' sales considerably."

Grand Rapids Plating Company, founded in 1923, operates a 150–175 employe plant at 1140 Monroe Avenue. It plates copper-nickel chrome on zinc die cast parts for plumbing fixtures, cars, home appliances and other products. Late in 1956 it completed a major addition to its plant, including the installation of new tanks allowing the plating of parts up to 24 x 48 in. in cross section.

Grand Rapids Die Casting Co., a wholly owned subsidiary of the Plating company, was established in 1953 and operates a 75-man plant at 2125 Turner Ave., on the north side of Grand Rapids. In addition to providing die castings on a competitive basis for the parent company's use, it sells plated and unplated castings to appliance, plumbing, automotive and other customers.

VANTON *notes on fluid handling*

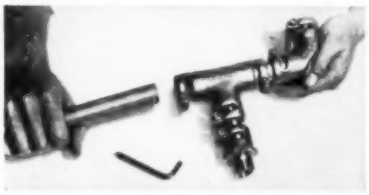
PUMPS · PIPE · FITTINGS · VALVES

NEW QUICK COUPLING STAINLESS FITTINGS CUT TIME AND COSTS

Shulton, Inc., Clifton, N. J. manufacturers of the Old Spice line of men's grooming aids, recently faced the problem of setting up a 1300 ft line of 1″ stainless steel tubing over a two-day week-end. They did it by using Quickupl, the new patented stainless fittings requiring no threading, welding, flaring, or heavy-wall pipe.

Since the lines to be put up were practically all overhead and had many take-off points to valves, tanks, and pumps, Shulton realized that standard threaded or welded fittings would take too much time, and disrupt production. With Quikupl couplings, elbows, and adapters two men set up the entire line in less than one day. The only tools required were a pipe cutter and an Allen wrench. This effected considerable savings in labor and substantial material economies by enabling the use of thin-walled tubing.

Quikupl fittings are a natural to use where rapid installation is required. In addition they are 100% salvageable, particularly suited for lines requiring constant changes. Furnished in sizes from 1″-4″, Quikupls are available in types 304 and 316 with a variety of seal rings to handle a wide range of corrosives. Write for BULLETIN 312.



New Literature:

Plastic "Flex-Plug" Gate Valve. Four-page folder includes detailed description and operational features of unique plastic gate valve. Technical data and dimensions are included. BULLETIN 313.

Technical Literature:

Folder offers nine items of technical literature on corrosion-resistant pumps, pipes, valves, and fittings. BULLETIN 314.

Pump leakage and metal contamination eliminated by plastic sealless pump construction

Pump problems on corrosive slurry removed by unique Vanton design

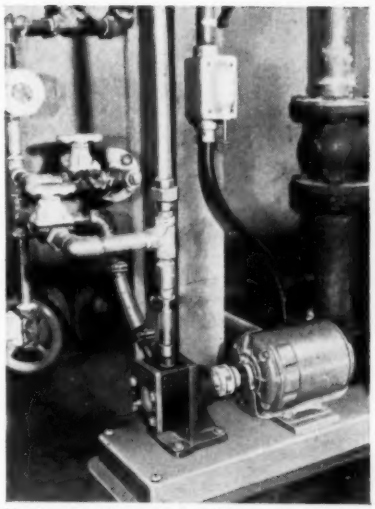
Product contamination, abrasion, and leakage problems at the Reheis Company's pharmaceutical chemicals plant in Berkeley Heights, N. J., were solved recently by installation of Vanton plastic sealless pumps. At Reheis, production of high-purity aluminum hydroxide gels, chlorhydroxide, and related fine chemicals demands the highest quality standards.

In one phase of the operation, pump problems threatened this quality requirement. Here Chlorhydrol and Chloracel fluids, running to 5% abrasive slurries, are recirculated through pH electrode assemblies. pH readings range from strongly acidic to strongly basic. The typical metal rotary pumps that were formerly used caused product contamination. Excessive maintenance was also encountered due to general corrosion and shaft scoring by the abrasive fluid, leading to costly seal leakage.

These problems were solved when Reheis purchased Vanton Buna N Plastic sealless pumps. Contamination was eliminated because no fluid touches metal parts, and leakage and abrasion problems were avoided by the pump's design with no stuffing boxes or shaft seals. Further, abrasion problems were avoided because the flexible liner absorbs the abrasive action of the slurry.

How Vanton Pump Works:

With stuffing boxes and shaft seals eliminated by the unique design, leakage is no longer a problem. Metallic contamination is impossible,



Vanton plastic pump handles corrosive abrasive slurry at Reheis Co., Berkeley Heights, N. J.

since the fluid cavity of the pump is formed by the inside of the channeled plastic housing and the outside of the synthetic liner. Flanges on the liner, clamped to the sides of the housing

by end plates, isolate all fluid to this cavity. Pumping is accomplished by a rotor mounted on an eccentric shaft, which rotates within the liner, creating a progressive squeegee action on the fluid trapped between the liner and the housing.

Capacities of the Vanton sealless plastic pump range from ½ to 40 gpm. Liners and housings are made in a variety of plastic materials, to suit a wide range of corrosive, acid, and slurry conditions. For further details, write for CATALOG 311.

VANTON PUMP
and Equipment Corp. • Hillside, N. J.
DIVISION OF COOPER ALLOY CORP.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE B 301.

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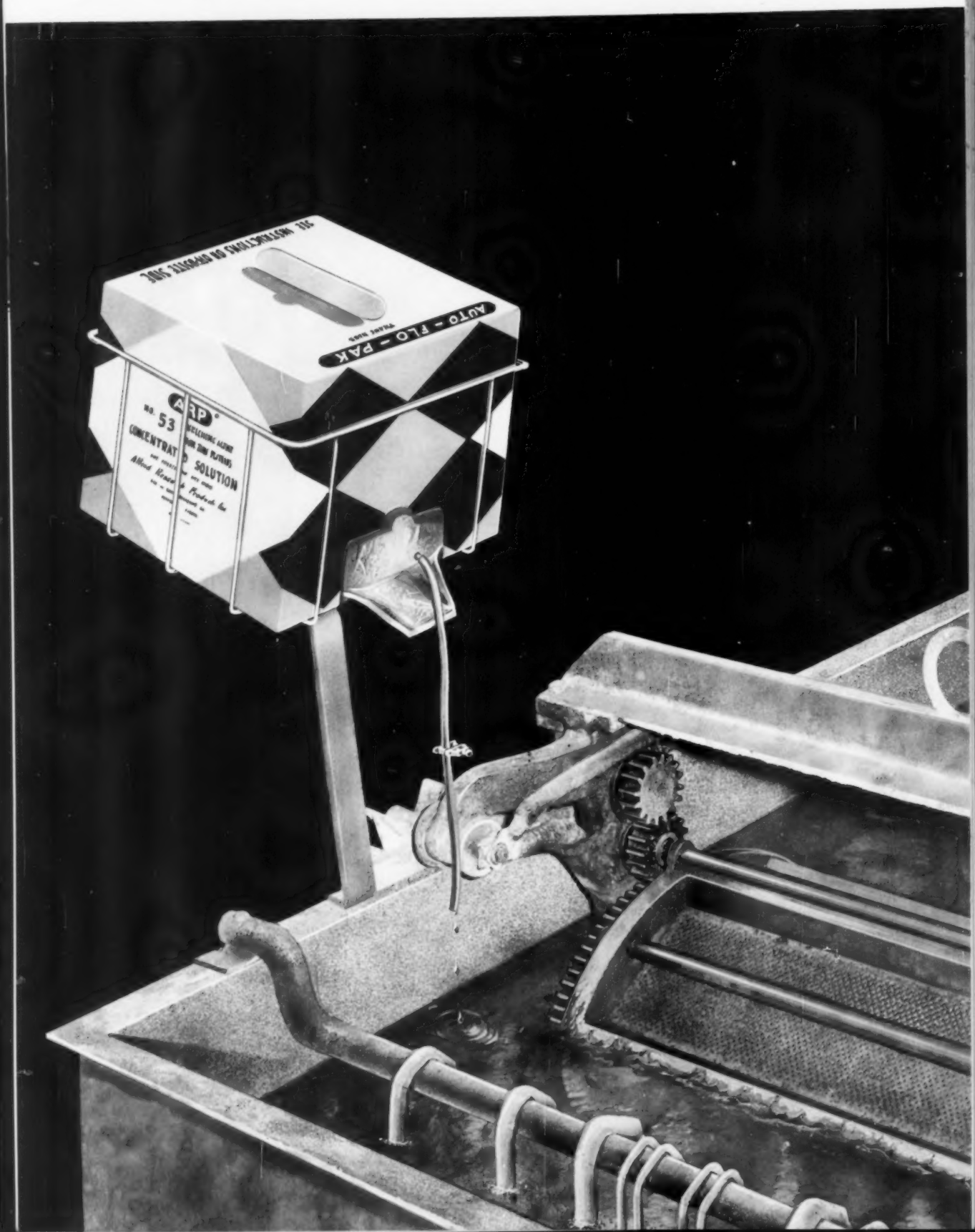
NOW, GET DIAMOND-BRIGHT ZINC



& CADMIUM PLATING *Easier with*

1—Revolutionary AUTO-FLO-PAK for Liquid Brighteners

TRADE MARK

Provides accurate, steady, automatic feed for more uniform plating, lower plating costs. When used with easy-to-set-up Auto-Flo Dispenser, you get:

AUTOMATIC MAINTENANCE OF PROPER BRIGHTENER LEVEL—This amazing AUTO-FLO-PAK and new brightener dispensing method require only a single setting to assure a constant, peak-efficiency, uniform flow of brightener. There's no danger of adding too little or too much . . . no waste, no muss, no bother.

MORE UNIFORM BRIGHTNESS, MORE UNIFORM PLATE—Each part you plate gets the full effect of brightener as it is fed into the solution . . . helps produce a uniform, diamond-bright plate throughout the entire run.

The AUTO-FLO-PAK consists of a specially designed one-gallon polyethylene container in a cardboard carton. It is designed for use in conjunction with the Auto-Flo Dispenser, consisting of a wire mounting rack and feed tube. The Auto-Flo Dispenser is available from Allied. For those who prefer to pour a specified amount of liquid brightener into the plating solution, the AUTO-FLO-PAK has a handy pouring spout on the top and a measuring window on the side.

The ready-to-use AUTO-FLO-PAK, 6 to a case, is easier to handle and gives better inventory control. You can tell at a glance what you have in stock . . . and you release just the right amount to your production line. The AUTO-FLO-PAK takes up less storage space and can be easily lifted on and off shelves.

The Auto-Flo Dispenser with the adjustable feed tube assembly provides absolute and positive brightener flow control. Once you set it, you forget it . . . and you automatically and constantly get maximum brightness, efficiency and economy. There's little chance of wasting any brightener. The Auto-Flo Dispenser is easily attached to any tank . . . does not interfere with plating operations.

2—New, Low-Cost ARP® #53 Liquid Brightener

A great new Liquid Barrel Zinc Brightener that gives you:

LOWER PLATING COSTS—ARP 53 is not only low in purchase price but low in operating costs.

LONGER LIFE—ARP 53 has excellent stability at high temperatures . . . also after shut-downs of the plating bath.

DIAMOND-BRIGHT FINISH—ARP 53 gives bright plate over a wide range of current densities in barrel plating. ARP 53 maintains excellent throwing power and reaches deep recesses easily with uniformly bright deposits . . . provides ideal plated surface for clear bright or colored Iridite coatings.

EASE OF USE—Like all ARP brighteners, ARP 53 is 100% organic in nature, easy to put into use and gives immediate results.

MORE GOOD NEWS FOR ZINC AND CADMIUM PLATERS!

ARP 31 for rack zinc plating and ARP 41 for all cadmium plating are also available in the convenient new AUTO-FLO-PAK . . . at slightly higher prices to cover special packaging.

SPECIAL INTRODUCTORY OFFER!

As a special introductory offer, we'll send you one Auto-Flo Dispenser at a special price of $4.40 with your first order for ARP 53, ARP 31 or ARP 41 in the AUTO-FLO-PAK, 6 to a case. Additional Auto-Flo Dispensers are available at regular price of $8.80. This offer expires MAY 31, 1958, so clip coupon, fill out and mail today.

PLEASE SEND ME:

_____ cases of ARP 53 (9 lbs. per AUTO-FLO-PAK) @ $ .75 lb. $40.50 per case.

_____ cases of ARP 31 (10 lbs. per AUTO-FLO-PAK) @ $1.02 lb. $61.20 per case.

_____ cases of ARP 41 (8 lbs. per AUTO-FLO PAK) @ $ .64 lb. $30.72 per case.

_____ also send me Auto-Flo Dispensers at $4.40 each.

_____ I would like more information of ARP # _____ and the AUTO-FLO-PAK.

NOTE: *Special price on Auto-Flo Dispenser applies only to the first case order on each brightener.*

Please send me _____ extra Auto-Flo Dispensers at $8.80 each.

COMPANY _____

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CITY _____ **ZONE** _____ **STATE** _____

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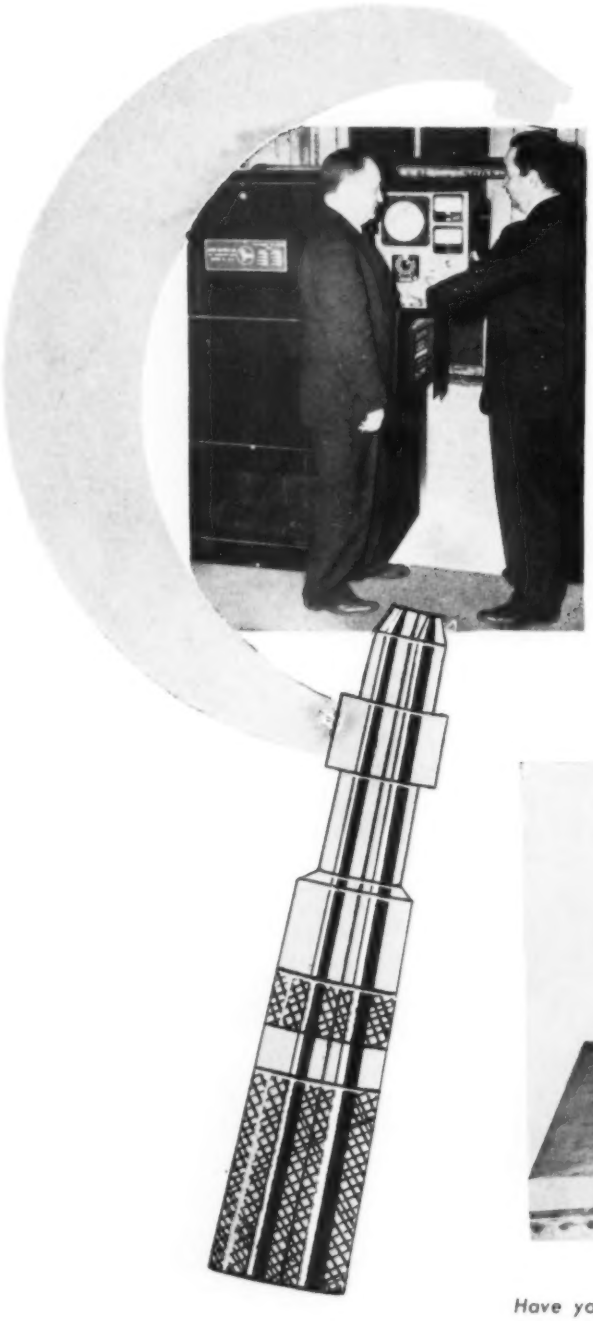
Manufacturers of

Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals

West Coast Licensee—L. H. Butcher Co.

Accurate Anodizing Company relies on RAPID automatic rectifier control for precision anodizing . . .



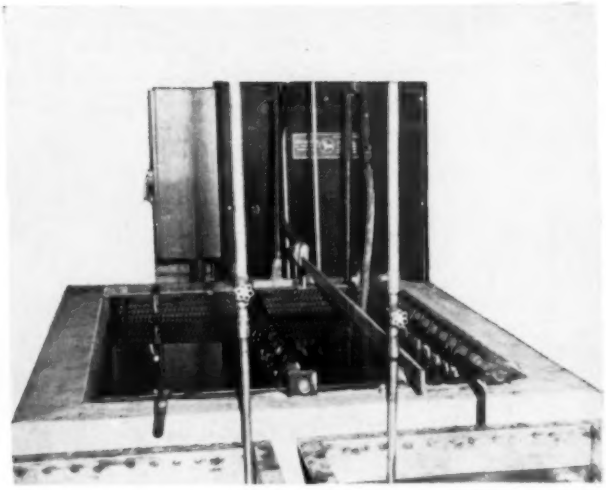
ACCURATE ANODIZING COMPANY of Chicago, Illinois, is a specialist in *Hard Coat Anodizing.

Maintaining a standard of quality indicative of its name is a constant challenge.

When special rectifying equipment was required to meet extremely critical specifications and close tolerances, A. A.'s staff consulted RAPID engineering specialists.

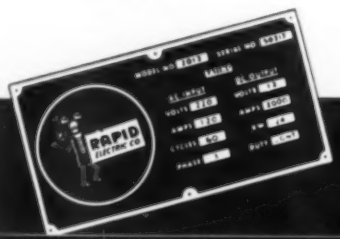
Recommendations of automatic voltage stabilization and step programming were acted upon. Result: Accurate thicknesses – held to close tolerances – accomplished automatically.

* Patented Process.



Have you a special power requirement?
Professional consultation service available without obligation.
Why not call us to-day?

INDICATE B 303.



THE NAMEPLATE THAT MEANS *"More Power to You!"*

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H. J. McCracken, left, President of Northwest Chemical Co.; Helen M. Morell, Vice President and B. F. Lewis, Secretary-treasurer.

NORTHWEST CHEMICAL CELEBRATES 25TH YEAR

Growth from a one room plant to one of the country's leading manufacturers of industrial chemicals for metal finishing, with over 23,000 sq ft of modern plant area, called for a celebration by Northwest Chemical Co. of 9310 Roselawn, Detroit, Mich.

High point of the festivities was a dinner given for all employes by the management and the surprise presentation, by the employes, of a large oil painting for the firm's new lobby and engraved watches to the three founders, H. J. McCracken—president and general manager, Helen M. Morell—vice president and B. F. Lewis—secretary-treasurer and chief technician.

The success of the firms operations was attributed to the splendid cooperation of labor and management and to the company's energetic research program which has kept their products abreast of today's rapidly changing requirements.

Besides the Detroit plant, Northwest has a West Coast manufacturing and sales operation and sales offices in Canada.

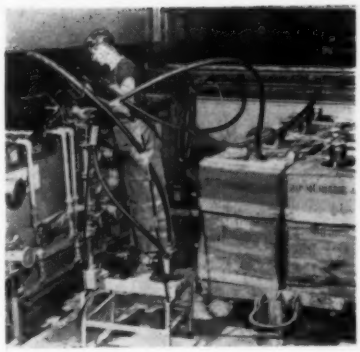
Interior of the new Research Building of the Hill Acme Co., Cleveland, showing a 50 in. wide reciprocating-table type abrasive belt machine; a 60 in. wide continuous process pinch roll type abrasive belt machine; a new design 2 in. single-spindle HA threading machine; and one of the company's new bar-billet shears completely automated with magazine and power feed table.

DIAMOND ALKALI TO END PINE BLUFF LEASE

Diamond Alkali Company, Cleveland, Ohio, has notified the United States Government that the company will terminate April 27, 1958, its lease for the operation of the chlorine—caustic soda plant at the Pine Bluff Arsenal, Pine Bluff, Arkansas, in accordance with the terms of the lease.

STEWART-WARNER PLATING FACILITIES REVAMPED

Automatic plating facilities for PR copper, bright nickel and chromium plating of steel stampings and zinc-base die castings at the Stewart-Warner Corporation, Chicago, Illinois, have recently been revamped by Graham, Savage & Associates, Inc., Kalamazoo, Mich. to incorporate improvements in engineering design and quality of product.



The chem-mill tanks replenished with hydrochloric (muriatic) acid conveyed by sealless plastic Vanton pumps at the Columbus (Ohio) Division of North American Aviation, Inc.

ANOTHER STRATFORD FIRST

BUFFING COMPOUND REMOVER

COMPOUND 320 COMPOUND 450

"A 1958 Compound for a 1958 Job"

FAST even on large "globs"

COMPLETE REMOVAL—all traces vanish

SAFE for all metals

BRIGHTENS BRASS—removes tarnish

REMOVES FINGERPRINTS in seconds

NO INSOLUBLE FILM FORMATION

WITHOUT EQUAL

—production tests at our expense if not satisfied.

FREE SAMPLES ON REQUEST

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FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 331.

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Los Angeles plant of Alert Supply Co. recently bought by Hanson-Van Winkle-Munning Co.

H-VW-M ACQUIRES ALERT SUPPLY CO.

Alert Supply Co. of Los Angeles, Calif., has been acquired by Hanson-Van Winkle-Munning Co. of Matawan, N. J. H-VW-M, established in 1820, is one of the na-manufactures electroplating and anodizing equipment, processes and supplies.

Alert, largest West Coast manufacturer of buffing compounds, will retain its corporate identity as a subsidiary of H-VW-M. The firm was organized in 1950, and has shown a steady growth pattern. The Alert management will continue with all personnel holding the same responsibilities. Western sales and technical staffs of Hanson-Van Winkle-Munning will join the Pacific Coast firm under the direction of Alert president, Alfred E. Perkins. Product lines of both firms will be continued without change.

The Hanson-Van Winkle-Munning Western office moved to the Alert Building at 2041 S. Davie Avenue, Los Angeles, on Feb. 1. Alert will continue its San Francisco office at 923 Harrison St.

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THE CLEVELAND PROCESS COMPANY
1965 EAST 57TH STREET • CLEVELAND 3, OHIO

BUTYRATE LACQUER

(*Continued from page 257*)

the brightener dissolved the grayish-white oxide film and, to a limited degree, attacked the aluminum itself. In order that the action of the chemical brightener be uniform and not result in a streaked appearance, the solution was brushed constantly during its contact with the aluminum. After three to four minutes the brightener was washed from the surface with a hose to remove all dirt and chemical residue.

Following cleaning and brightening, the surface of the aluminum received a further treatment with a passivating agent. Tests have shown this treatment provides maximum adhesion and life to the butyrate lacquer coating. The passivating agent was hosed off the aluminum after two to three minutes' contact.

Thinned approximately 1½ times its own volume, a single coat of the lacquer was sprayed onto the aluminum after drying to achieve a coating approximately 0.3 mils thick at approximately 40 lb pressure. The lacquer was applied with an ordinary gun from a portable tank.

ANDREW PERRIN

Andrew Perrin, an active member of Waterbury Branch for over 27 years, died on December 23, 1957. He was very active in the early days of AES.

Born in Belforte, France on September 14, 1877, he started work for the Waterbury Manufacturing Co., now a division of Chase Brass & Copper Co., in July 1893. He spent most of his time in metal cleaning and finishing operations and retired on October 1, 1946, as general foreman of the plating, dipping and cleaning departments.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 332.

INDUSTRY NEWS BRIEFS

UNITED STATES NICKEL DEPOSIT DEVELOPED

Completion of initial development of a vast nickel deposit in Josephine County, Oregon has been announced by Edward N. White, president of New Delhi Mines Limited of Toronto.

According to a report submitted by a firm of prominent Canadian mining consultants, pitting operations to date have established ore indications of 8 million net tons in one of the three areas being worked, with a potential considerably larger than 52 million gross tons. The nickel content has been calculated to be 1.24 per cent.

It is felt that the deposits may be the largest uncovered in the United States.

PLATINUM DROPS ANOTHER $5 PER OUNCE

A reduction of $5.00 per troy ounce in the price of platinum occurred February 14. The new price became $72 to $75 per ounce. This is the first reduction since December 8 when the market went down about $5.

The market had been weak for some weeks and some sales had been made at prices under the regular market. It is understood that the appearance of Russian platinum had a depressing effect on the market.

NICROMATIC LTD. LICENSED BY ENTHONE

Enthone, Inc. of New Haven, Connecticut, subsidiary of American Smelting and Refining Company, has announced the appointment of Nicromatic Ltd., 20 Drummond Street, Toronto, to manufacture, distribute and service the complete line of Enthone products for the metal finishing industry. The licensing arrangement covers Eastern Canada. Nicromatic will now manufacture a complete line for immediate shipment to Canadian industry. This arrangement, in addition to providing technical and delivery service, will bring about a significant reduction in price for Canadian users.

COPPER SULFATE IN DECEMBER 1957

Production and shipments of copper sulfate in the United States in December fell 11 and 53 per cent, respectively, below November, according to the Bureau of Mines, United States Department of the Interior. Shipments, totaled 1700 tons less than production. Stocks increased 69 per cent to exceed more than a month's needs at the December rate of shipments.

BOOKLET EXPLAINS SELLING TO GOVERNMENT

How small business concerns can sell to the Federal Government is explained in a new booklet.

The booklet, "ABC of Selling to U. S. Government," tells how the Government buys, gives general suggestions on selling to it, and discusses Small Business Administration services to small firms in selling to Federal purchasing agencies and their prime contractors.

Agency services discussed include cooperation with purchasing agencies in having suitable purchases reserved for competitive bidding among small firms; certification of small firms as competent to perform specific Government contracts on which they are low bidders or are within negotiation range; referral of prime contract and subcontract opportunities to small firms, and co-sponsorship of business opportunity meetings where small firms can learn of items and services needed by the Government and prime contractors.

Copies of "ABC of Selling to U. S. Government" may be obtained from the Small Business Administration, Washington 25, D. C., and from Agency field offices.

Brass Plating

●

We can have trouble enough plating a single metal. With two metals combined the plating is many fold more complex. Zinc and copper in the higher copper alloys have been plated for many years. Very little attention has been paid to the fundamentals of solution, control and operation. The chemistry of the complexes involved is very complex.

●

One of the first things we found out was that the use of "free" cyanide had to be discarded both for control and analysis. While many analysis methods list this it does not provide a sound basis for control. We have some different ideas based on a "total" sodium cyanide which gives a reproducible analysis and has a good theoretical foundation.

●

The ratio of copper to zinc is also a misleading criterion. Actually the ratio of copper to zinc may be widely varied without giving off color plating provided the proper criterion are observed.

●

*p*H is not too critical in brass solution. Zinc solubility is lowered with *p*H below 9.5. Above 10.5 adverse effects appear in the extreme low current density areas.

●

Ammonia is a much abused addition agent. The effect of ammonia is to increase the zinc in the plate. An excess at room temperature will even cause white bands in the plate. The proper amount of ammonia is about 1 quart of aqueous ammonia per 100 gallons of plating solution. Excesses beyond this sometimes will bring a solution into operating condition but this indicates that the solution is out of balance. Ammonia is a good brightener and when used at the proper times in proper amounts gives clear plating.

●

Balanced additions are important. Very few people have the patience or plating departments the equipment for the accurate weighing of ingredients that should be added. The best platers buy the balanced formulation of True Brite Brass Maintenance Solution and Compound and secure the uniform results that go with good plating. Costs are low since we make our own copper and zinc cyanide. It takes time to show what this can do for you so why not get started now. Yellow brass is the standard and while it's touchy we have the operational techniques and materials to help you do the bronze colors too.

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USE READER SERVICE CARD; INDICATE A 333.

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...engineered and built to specifications, save maintenance dollars ...cut downtime.

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Agilene (polyethylene) and Agilide (PVC) installations are widely used in the chemical and allied industries. They quickly pay for themselves by outlasting previously used materials.

Write for full details on Agilene and Agilide corrosive resistant exhaust systems . . . there are components to cover all phases of fume ventilation from the exhaust hood — to fan — to the weather cap above the roof.

Double lateral exhaust ducting of 6⅝" O.D. Agilene material, all welded construction to be attached to duct line. 30" diameter stock sections for exhaust system.

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Acknowledged pioneers in the engineering and welding of structural plastics.

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PATENT ABSTRACTS

DR. D. GARDNER FOULKE
Manager, Electrochemical Development
Hanson-Van Winkle-Munning Co
Matawan, New Jersey

Copies of patents may be obtained by writing to Commissioner of Patents, Washington, D. C. Price 25 cents each.

No. 2,809,138, 10/8/57—Process of Treating Metal Surfaces—E. Wagner and A. Moeller, assignors to Farbwerke Hoechst Aktiengesellschaft, Frankfort, Germany.

The bath consists of oxalic acid anions 0.5 to 140 g/l, 0.025 to 5 g/l of a water soluble compound selected from xanthates, dithiophosphoric esters (alyhatic and eromatic) thioglycolic acid and thiourea. The *p*H is from 1.0 to 2.4.

10 claims.

No. 2,813,067, 11/12/57—Hydrazine Manufacture—A. Stuart, assignor to Sun Oil Co., Philadelphia, Pa.

Electrolysis of an alkaline earth amide in formamide to form hydrazine is described.

4 claims.

No. 2,813,068, 11/12/57—Production of Titanium—M. Steinberg and A. Topinka, assignors to Horizons Titanium Corp., Princeton, New Jersey.

The use of a fused bath of an alkali metal fluotitanate is described.

4 claims.

No. 2,813,069, 11/12/57—Porous Anode—B. Raynes, et al., assignors to Horizons Titanium Corp., Princeton, New Jersey.

A porous carbide anode is described for use when electrolyzing fused salt baths to obtain Ti, Zr, Hf, Va, Ta and Cb.

4 claims.

No. 2,813,803, 11/19/57—Composite Metallic Material—H. Homer and J. Whitacre, assignors to Commonwealth Engineering Co., Dayton, Ohio.

Lead is deposited on the oxidic surface of aluminum by gas plating, after which a layer of another corrosion resistant metal is laid down on the lead while it is still plastic.

4 claims.

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Harder CRACK FREE deposits. Increased throwing power. Less sensitivity to sulfate content. Exceptionally fine results plating anything calling for Decorative or Hard Chrome.

ZIALITE CORPORATION

92 Grove Street Worcester 5, Mass.

No. 2,813,804, 11/19/57—Lead Coating Process—F. Kendall and P. Golar, assignors to Steel Ceilings Inc., Cleveland, Ohio.

It is claimed a protective and substantial, sound, adherent deposit of lead can be put on ferrous articles by immersing said articles in an aqueous solution of a lead salt of an aliphatic monobasic hydroxy acid at a *p*H below 7.0. The lead ion concentration is given as 50 to 250 g/l and the temperature as 155 to 200F.

7 claims.

No. 2,813,812, 11/19/57—Phosphating Composition—R. I. Somers and J. Rotako, assignors to Parker Rust Proof Co., Detroit, Mich.

An aqueous solution for coating iron or zinc surfaces is described as containing 0.5 to 2.5 per cent phosphate ion, zinc or manganese ion in sufficient amount to form dihydrogen phosphate with said phosphate ion, 0.01 to 0.4 per cent nickel ion, 0.0003 to 0.005 per cent copper ion and an oxidizing agent (NO_3^- at 0.2 to 1 per cent, NO_2^- at 0.002 to 0.008 per cent).

A replenishing solution is also described.

10 claims.

No. 2,813,813, 11/19/57—Phosphate Coatings—H. Ley, et. al., assignors to Parker Rust Proof Co., Detroit, Mich.

The method for forming a protective coating on metallic (ferrous in 3 claims) surfaces includes heating the object to a temperature above 400 C in an oxidizing atmosphere to form oxide coatings, cooling in an inert atmosphere to 100–400 C, then bringing into contact with a phosphate coating solution.

5 claims.

No. 2,813,814, 11/19/57—Phosphate Coatings for Zirconium and Titanium—E. Goodspeed and F. Pollard, assignors to Parker Rust Proof Co., Detroit, Mich.

Contact the titanium or zirconium articles with a solution consisting essentially of manganese dihydrogen phosphate, titanium, or zirconium ions (at least 0.05 per cent), an ozidizing agent (equivalent to 0.5–1.3 per cent nitrate ion), Na, K, or NH_4 ions and fluoride in excess of the concentration of titanium or zirconium.

16 claims.

No. 2,813,815, 11/19/57—Phosphate Coatings—D. Miles, assignor to American Chemical Paint Co., Ambler, Pa.

Claim 1 reads: "In the art of preparing a succession of metal articles for the reception of a siccative finish where the surface of the articles is first provided with a phosphate coating, the method of successively treating the phosphate coated articles initially with a dilute rinsing solution consisting essentially of acid from the class consisting of chromic and phosphoric acids, thereafter treating each article so rinsed only with virgin, uncontaminated rinsing solution as a final rinsing step, collecting the run-off rinsing solution from said final virgin rinsing step and delivering it as replenishment to the initial rinsing solution, and drying the articles after treatment with the final virgin rinsing solution."

2 claims.

No. 2,813,816, 11/19/57—Coating Stainless Steel—G. Otto, assignor to American Chemical Paint Co., Ambler, Pa.

A coating particularly suited to assert in drawing stainless steel can be obtained by immersing in a bath of mineral acid (HNO_3 H_3PO_4, H_2SO_4, NH_2SO_2OH, H_2SO_3) manganese oxalate and a sulfur-bearing compound capable of yielding sulfur dioxide in acid solution.

17 claims.

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MAIL BOX

DEAR SIR:

The article entitled "Dimensional Etching—Its Application to Airframes" by Richard H. Andrew and Jacque L. Duvall in the November (1957, pp. 1186–1190) issue of PLATING contains a reasonably accurate description of chemical milling as it is currently employed by the aircraft industry.

However, in the bibliography of the article, the authors list ten patents, of which only one bears a date later than 1953, and in the body of the article it is implied that the contouring of structural parts was disclosed or suggested by the older patents.

The true facts are that the Sanz Patent to North American Aviation (No. 2,739,047) was the first and only one of those listed by the authors to disclose structural parts manufacture by etching; all of the others relate to lithography or decorative arts, wherein a "deep" etch may be $^1/_{16}$ inch or so, versus $^1/_4$ to $^1/_2$ inch in present-day chemical milling. The surface finish of the etched area was of no great significance to the earlier patentees, so long as an outline in low relief was produced, whereas in aircraft parts manufacture (as the authors properly state) etched surface smoothness has a critical influence on the fatigue strength of a part.

I believe your readers are entitled to know that every user of chemical milling in the aircraft industry today is a royalty-paying licensee under the North American Sanz Patent, and that the following additional patents covering the Chem-Mill Process of chemical milling have been issued:

A) To North American Aviation:
2,724,918
2,762,035
2,762,036

B) To Turco Products, Inc.
2,739,883
2,762,694
2,795,490
2,795,491
2,801,909
2,762,150
2,802,726

Additionally, three pending applications under allowance from the United States Patent Office will issue as patents to Turco within the next 60 days.

Turco Products, Inc. is the exclusive sub-licensing agent under all of the North American Aviation and Turco patents. No other chemical milling patents, so far as we know, are being licensed or used.

JOHN F. CROWTHER
General Manager
Chem-Mill Division
of Turco Products, Inc.
Los Angeles 1, California

DEAR SIR:

We noted Mr. John F. Crowther's letter with interest and are somewhat at a loss to understand his concern.

It was clearly the intent of our article "Dimensional Etching—Its Application to Airframes" to present a brief but concise view of the general practices and basic considerations of structural etching in the aircraft industry. It was not our intent to indulge in a lengthy dissertation on either the history or current proprietary accomplishments of ourselves or others. To this extent we feel we achieved our aim.

JACQUE L. DUVALL
RICHARD H. ANDREW
Wyandotte Chemicals Corp.
J. B. Ford Division
Los Nietos, California

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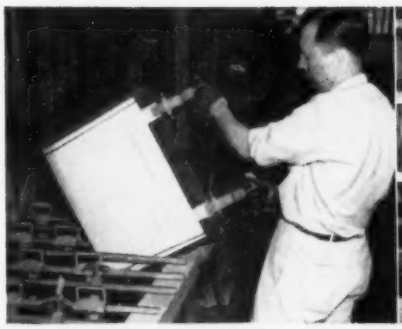
on page 278



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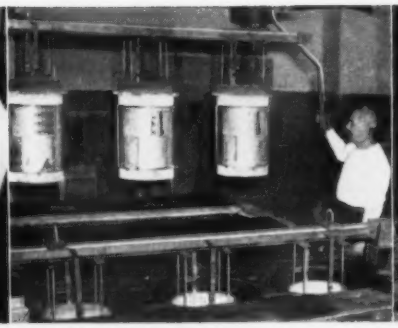

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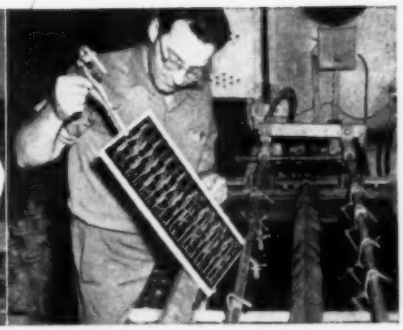

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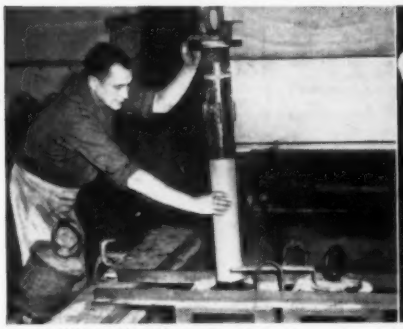

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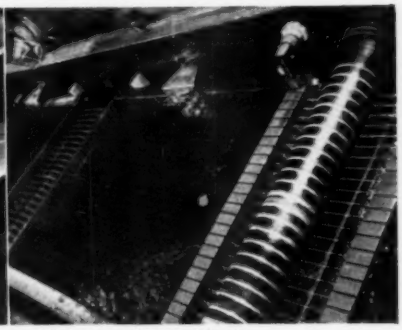

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Lea Mfg. Company of England, Ltd., Buxton, England
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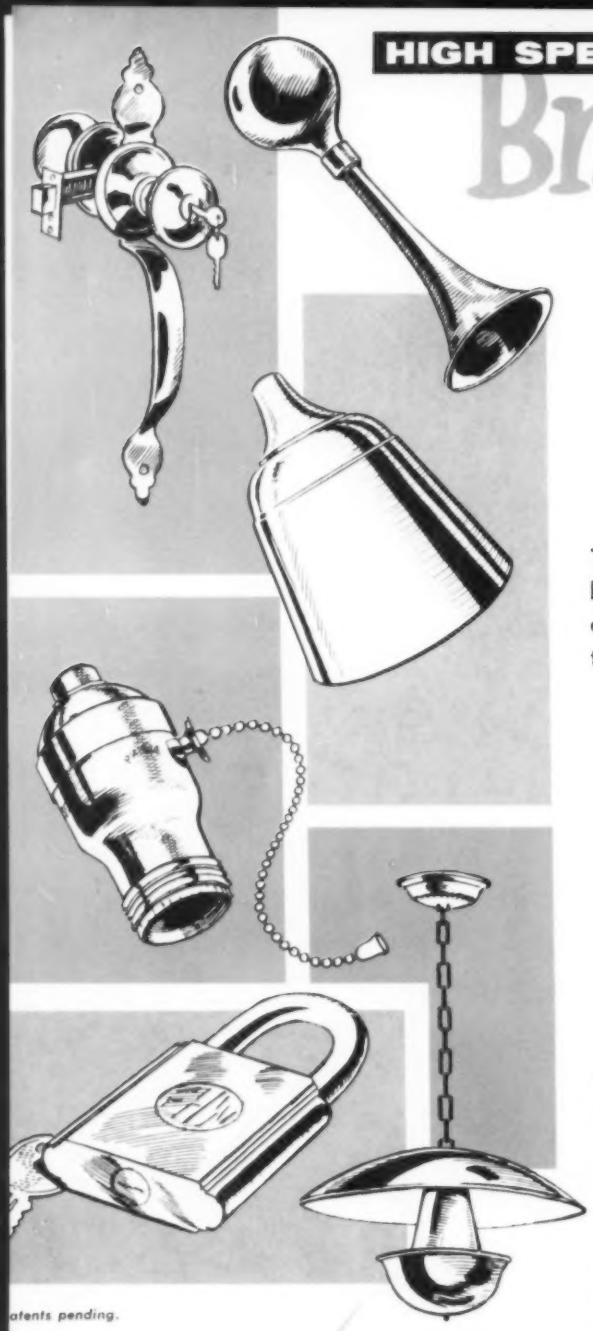

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◀ INDICATE B 305.

RESULTS OF AES RESEARCH PROJECTS CONTAINED IN THESE SERIAL REPORTS

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The Influence of the Physical Metallurgy and Mechanical Processing of the Basis Metal on Electroplating IV—By M. H. Jones, Chih-Yeu Lu and J. Zajdowski. — *Serial 38, Project 14, $1.25*

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PERSONALS

C. C. Whitt

C. Kiser

Charles C. Whitt has joined Bill Young and Co., Inc. as salesman to serve the Kentucky-Tennessee area.

He was with the United States Navy in the Pacific for two years before studying industrial chemistry at Murray State College and the University of Kentucky.

Mr. Whitt was associated with International Harvester Company for six years. He has been the chemist and the foreman in charge of assembly and finishing for the past two years for Universal Button Company, Lawrenceburg, Kentucky.

Ben R. Badeusz, formerly assistant to the vice president in charge of manufacturing at Great Lakes Plating, Chicago, is the newly appointed sales representative in the greater Chicago area for Wagner Brothers Inc., Detroit.

Before joining Great Lakes, he was assistant production manager for Kentile Co. Prior to that he was associated with Mall Tool.

George A. DeCario, for the past two years field service engineer, has been appointed district manager of the Northern Ohio area which includes Western Pennsylvania, for Wagner Brothers. He will make Cleveland his headquarters.

Prior to joining Wagner, he was general foreman at General Motors' Ternstedt Division.

Robert G. Wild of 873 Roanoke Road, Cleveland Heights, Ohio has been named as representative for Heatbath Corp. for the northern Ohio and western Pennsylvania area.

Mr. Wild was formerly with the R. O. Hull Co. and R. W. Renton Co., both of Cleveland. He is a graduate of Western Reserve and is very active in the Cleveland Branch of the AES.

Gerald Ott, former Heatbath representative in this area has resigned to return to private business.

Clayton Kiser has joined Frederic B. Stevens as sales engineer.

Mr. Kiser comes to Stevens from the Frigidaire Division of General Motors where he has been employed as an electrochemist for several years.

A graduate of the University of Kentucky, Mr. Kiser will represent the Stevens concern, in southern Ohio, Kentucky and Tennessee. He will make his headquarters at the Dayton Branch on 516 Broad Boulevard.

Norman Hill has joined Clifford-Rockwell Co., Detroit, Michigan, as a sales representative. Formerly with the Chrysler Corp., Mr. Hill brings a varied industrial background to the company and will handle the Detroit territory.

N. Hill

R. E. Martin

Richard E. Martin has joined the staff of the Jackson Plating Co., Jackson, Mississippi, in the capacity of chemist. He will be in charge of quality control and the development of new processes.

After serving three years in the Marine Corps, in electronics, Mr. Martin attended the University of Nebraska where he was graduated with a BS in chemistry. He has had 10 years progressive and responsible experience in the metal finishing field. His most recent assignment was as chief, Surface Treatment Unit, Fabrication Laboratory, Army Ballistics Missile Agency, Redstone Arsenal. During this assignment, Mr. Martin installed and operated facilities for the plating, anodizing and other surface finishing of metals. He is a member of the American Electroplaters' Society and the American Chemical Society.

(Continued on page 292)

PREVIEW OF FUTURE PLATING ISSUES

●

APRIL 1958

TECHNICAL RESEARCH. Not only will this issue spotlight recent developments in the AES Research Program but will also be the pre-1958 ANNUAL CONVENTION feature issue.

●

MAY 1958

CONVENTION ISSUE. Inasmuch as the 1958 Annual Convention will be held in Cincinnati, Ohio, May 19–22, this feature issue will come in May instead of June as customary.

●

JULY 1958

POST CONVENTION ISSUE. Among other features, it will contain a pictorial and narrative account of the 45th Annual Convention.

●

AUGUST 1958

WATER AND WASTE TREATMENT. Another edition of this informative and popular feature.

●

NOVEMBER 1958

AIRCRAFT. Electroplating and metal finishing in the aviation industry will be featured in this second annual edition.

●

THE JUNE, SEPTEMBER, OCTOBER and DECEMBER issues loom as strong 1958 General Issues.

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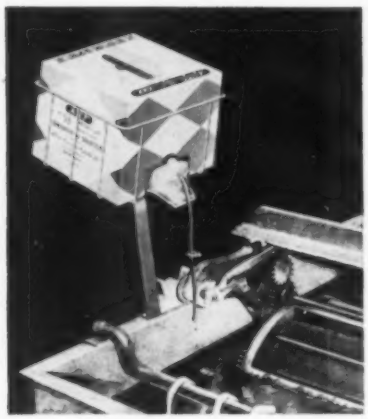

E—301. Dispenser Carton—Allied Research Products, Inc. is offering liquid brighteners in a new automatic-dispensing package, the auto-flo-pak. In making the announcement, the manufacturer described the package and its dispenser as a new concept that gives superior control of liquid brightener feeding and makes storage and use more convenient and economical.

It consists of a specially designed one-gallon, cube-shaped, disposable polyethylene container in a corrugated cardboard box. When used with the dispenser, consisting of a wire mounting rack and feed tube, it permits precise control over liquid brightener feed and increases brightener efficiency. The package has a handy pouring spout and measuring window.

E—302. Coloring and Burnishing Compound—Developed for all metals or alloys, Lorco lustre-all is suited for shops in which the number of barrel-finishing compounds must be kept to a minimum. This new all-purpose coloring or burnishing compound is said to impart a high gloss and a virgin-metal color to any metal or alloy in a run of 45 min to one hr. It is claimed to leave no film of any kind and to yield clean work.

This compound will work with standard coloring or burnishing media.

E—303. Varnish Remover—All types of varnish, regardless of toughness and thickness of coating, can be stripped quickly and easily with a non-flammable impregnating varnish remover developed by London Chemical Co., according to the company. The remover is said to be able to strip clean accumulations up to 2 in. thick in five hours or less. It works with air-dried or baked varnishes, regardless of baking temperature and is claimed to be economical because of both its quick action and the surface seal which prevents evaporation of the stripping power.

It is applied by either brush or dip. For dipping, the only equipment needed is a covered steel tank large enough to accommodate the pieces to be stripped.

E—304. Automatic Machine—Development of a new automatic machine using a liquid abrasive process to give a microscopically smooth finish to aircraft, missile and automotive components is announced by The Lewis Welding & Engineering Corp.

The machine features an automatic method of handling the parts during the abrasive process and a new type of oscillating air blasting gun which is fed by a pump. The liquid abrasive or slurry is supplied to the gun in any pre-determined mixture.

The new liquid jet-stream finishing process automatically handles different sized components. This is achieved by means of two interlocking sets of moving rubber belts.

E—305. Loading Arm—A new mechanical loading arm which eliminates the need for lifting fixtures manually, has been added by Grav-i-Flo Corp. to its spin-finish machine.

The mechanical loading arm is pneumatically powered with finger tip hydraulic control. It is said to provide quick, easy pick-up of fixtures for loading and unloading the spin-finish machine. This cycle is controlled by one button which operates the loading arm vertically. For horizontal motion, the operator extends or retracts the telescoping arm.

At the end of the mechanical loading arm is a fork which fits under the collar of the fixture. This fork and collar arrangement permits the operator to pick up fixtured parts and place them into the machine.

E—306. Lucite Barrel—Frederic B. Stevens, Inc. has added a new lucite cylinder to its line of barrels for use on Stevens Model C and E automatic barrel plating and processing machines.

While incorporating all of the advantages of the older oblique lucite barrel, this new cylinder has a number of design improvements such as: an offset bottom that mixes the work better and reportedly increases the number of different parts that can be plated in an automatic barrel machine; a heavy rib which goes completely across the bottom of the barrel; a heavy ring reinforcement at the mouth of the barrel to provide protection against mechanical damage while loading; plastisol covered steel bales mounted between lucite guides; Lucite studs that hold the barrel to the bale.

E—307. Buffing Compound Remover—Stratford Chemical Co., Inc. announces a new, high-speed buffing compound remover which removes fingerprints and oil as well as buffing compounds. The new remover, designated Compound 450, is said to combine speed of removal and completeness of removal with economy of operation. It does not stop on large "globs" of buffing compound but continues to dissolve until the work is clean. It is said to be safe to use on all metals, and will not etch or attack aluminum, zinc, brass, copper or steel. It removes tarnish and brightens copper and copper alloys, according to the company and produces no insoluble film. Solution may be allowed to dry on work (long transfer times) before rinsing without any "cloud" occurrence under plate. In fact, work may be transferred directly to an alkali without rinsing with no subsequent clouding. Supplied

as a concentrated liquid, it is used at three percent and 180F in a plain steel tank. It is claimed by the manufacturer to have extremely long life together with extremely high tolerance for buffing compounds.

E—308. Sealing Compound—Development of a new sealing compound, Sandofix ALU, has just been announced to anodizers by Sandoz, Inc. This product is said to be the first non-smutting sealer for anodized aluminum.

It is claimed to eliminate post-sealing buffing and coloring of anodized products and improve in appearance products which cannot be buffed due to their shape.

The compound can be used in existing equipment and requires no change in anodizing procedure.

E—309. Spray Coating—Electroplating racks may be insulated against metal plating with Krylon crystal-clear spray protective coating. By insulating them except where they make contact with the cathode buss bar and the pieces to be plated, the current used is directed to the piece to be plated rather than some of the current being directed to the rack.

By not allowing the rack to be plated, there is a saving in metal. The racks are said to be usable for a much longer period since they do not become very bulky due to deposited metals.

E—310. Silicon Diodes—International Rectifier Corp., announces the availability of high current silicon pigtail diodes featuring forward and reverse characteristics which result in high rectification efficiency.

Now in full production, this series, comprised of Jetec types IN536 through IN540, is rated at 750 ma at 50C, and 257 ma at 150C ambient, with peak inverse voltage ratings of 50, 100, 200, 300 and 400 volts respectively. The maximum full load average voltage drop of these diodes is 0.5 v. Maximum leakage current is 0.4 ma (full cycle average at 150C). The typical diode characteristics are well within these specified maximum values.

These fused junction diodes, featuring all-welded, hermetically sealed shockproof housings with pigtail leads welded to the terminals, are used in computers, magnetic amplifiers, power supplies, airborne electronic equipment, and other applications where miniaturization and high temperature operation is required. They can be operated in ambient temperatures from −65 to + 165C, and may be stored at −65 to + 175C.

E—311. Fume Scrubber—A specially designed scrubber engineered and constructed by Heil Process Equipment Corp., captures and removes the corrosive fumes given off by a titanium pickling bath. The bath contains 40 per cent nitric acid, and a smaller percentage of hydrofluoric acid. The scrubber is of packed tower type, constructed of steel lined with sheet Koroseal. The scrubbing solution, flowing counter to the motion of the air being scrubbed, is recirculated.

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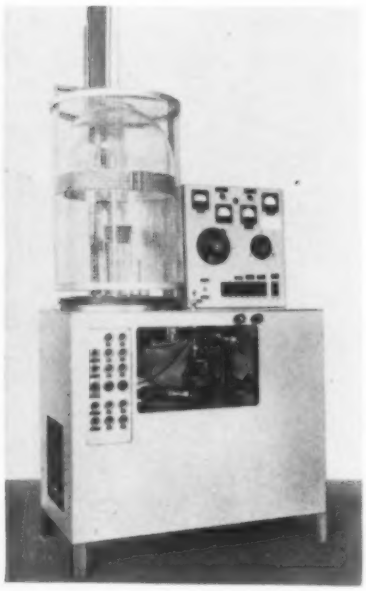


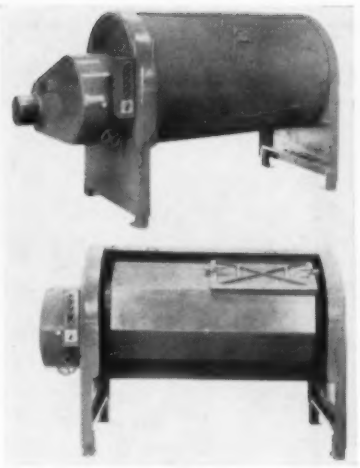
E—312. High Vacuum Evaporator—Vacuum Equipment Division of The New York Air Brake Co. in announcing their newly designed SC-2 high vacuum evaporator, states that this unit has been expressly designed for laboratory and pilot plant use in such work as selenium and germanium deposition, base plating of crystals, carbon evaporation, vacuum metalizing and optical coating. The manufacturer claims that the new design materially broadens the scope of investigations possible with the equipment, as well as developing important economies in operating cost and maintenance.

The SC-2 features extra pumping capacity for fast pumpdown, with a 4 in. high speed, four-stage oil diffusion pump backed by a 13 cfm single-stage mechanical pump attaining operating pressures in less than 10 min. and an ultimate vacuum of 1 by 10^{-5} mm Hg.

E—313. Barrel Finishing Machines—Fifteen models of barrel finishing machines with capacities ranging from 5 to 25 cu ft are now being manufactured by Crandall Engineering & Manufacturing, Inc.

Designated the No. 30 series, the new machines feature streamlined design, smooth operation, and a new cylinder sealing method for leak-proof operation under all conditions.

The machines employ oversize varispeed V-belt system instead of the conventional chain drives. This, combined with other engineering and manufacturing innovations, have reduced shock and vibration to such a degree that the machine can be operated, including stopping and jogging, with a coin balanced on top of the housing, it is reported.



The leak-proof design is accomplished by precision vulcanize molding the sealing surfaces on both the cylinder opening and the cylinder door.

Push button controls are located on the left side of the machine, with positive safety jogging to allow operator to inch cylinder forward or reverse during loading or unloading.

E—314. Plastic Air Scrubber—A new lightweight fume washer, said to be completely resistant to corrosion, is designed to

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remove acid-laden or harmful vapors and plating fumes from air exhausts.

The corrosion resistance, lightweight, rigidity and freedom from maintenance of this unit make it ideal for use by aircraft, electronic and chemical industries, according to the manufacturer. The new fume washer is designed of glass fiber-reinforced polyester.

Because of its plastic composition it weighs only one-third as much as conventional steel units. In addition, the unit's lightweight allows roof installation (conserving valuable production floor space) and makes possible easy installation by plant maintenance personnel.

The L-O-C fume washer is manufactured by Line-O-Coat Co.

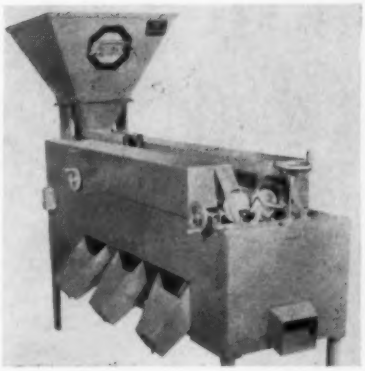
E—315. Plate Heater—A new Karbate impervious graphite plate type heat exchanger featuring an adjustable and removable elbow connection is available from National Carbon Co. Division of Union Carbide Corp. Used in the plating and metal finishing industry, the style VHUS plate heater now provides flexibility of installation, and elbow replacements can be made in the field.

The removable, bolted elbow connection is said to be stronger than the previous cemented construction, and can be swiveled to any desired angle, providing easy connection to the steam or water piping. Should the connection be damaged in service, it is no longer necessary to return the entire plate heater to the factory for elbow replacement.

Elbows and accessories can be packed separately, and the plate heaters shipped knocked down.

E—316. Dimensional Separator—The Esbec dimensional separator has been re-designed to give it greater accuracy, more flexibility and longer life according to the company.

This machine will make difficult separations which otherwise must be hand picked, it is reported.



Separations are made by reason of difference in critical dimensions. Thinner, flatter pieces drop through the adjustable gap between the rolls while thicker, chunkier pieces are carried off the end of the rolls.

The new design includes three separate discharge chutes underneath the rolls and one at the end. When the gap between the rolls is set in a V-shape, as many as four separations can be made at one time.

Greater accuracy and longer life are said to result from the fact that the 4 in. diameter rolls are deep hardened and, with their shafts, are ground on centers.

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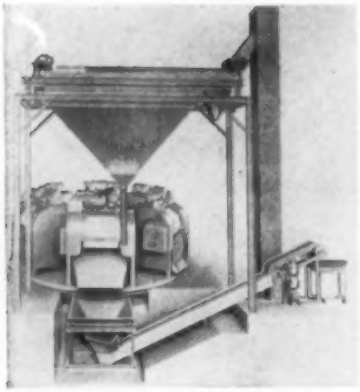

E—317. Barrel Finishing System—A 6-station automatic barrel finishing system, mounted on a turntable and equipped with a "memory" device, has been developed by Almco, Queen Products, Inc. It automatically rotates completed work to a single operator station for unloading and reloading. The system makes it possible for one operator to efficiently handle six barrel finishing machines (12 where systems are combined). It also is said to eliminate the need for duplicate materials handling equipment.

Each mounted barrel finishing machine is loaded with parts, media and compound at a single work station, and completed work is automatically returned to it for rinsing and mechanical separation thus permitting an in-line production flow of parts from previous processes and out to other departments.

E—318. Aluminum Etchant—American Chemical Paint Co. announces a new aluminum etchant designed to insure a consistently uniform etch pattern and etch rate without scale build-up on tanks and coils. These advantages are independent of the aluminum concentration in the bath.

It is claimed that the type of etch and rate of etch will not vary when etchant is used in industrial waters of various hardness.

E—319. Vacuum Metalizing System—A new coating used in conjunction with vacuum metalizing, designed to cure at low temperatures and said to have advantages on soft metals, has been announced by Bee Chemical Co.

The vacuum coating formula designated as M-246H uses the same base and top coat and cures at temperatures of 180 to 290F. Although the coating cures at very low temperatures, it is claimed to be resistant to alcohols, boiling water for one hour, temperatures of 400F and have exceptional hardness, adhesion and abrasion resistance. While originally designed for soft metals, it is said to have excellent adhesion and equally good properties when used on thermosetting plastics, such as phenolics, ureas, etc., where curing at higher temperatures causes production problems.

E—320. Finishing System—A finishing system based on Bakelite epoxy resins can turn parts fabricated from ordinary sheet metal and die castings into lustrous, decorative pieces according to the company. The coating system developed by Rexton Finishes, Inc., produces brass colored finish that is said to be resistant to scratching, peeling, discoloration, dulling or tarnishing. This finish adheres tightly to either plastic or metallic surfaces, including properly prepared zinc and aluminum die castings.

E—321. Drum Sander—New, additional sizes have been added to the Cone-Loc drum sander line for a wide variety of job applications. This drum sander makes it possible to use ordinary strips of coated abrasive instead of belts.

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of coated abrasive in grits from coarse to fine it is possible for this single tool to be used for all stages of metal removal, grinding and polishing. Abrasive strips can be quickly and easily wrapped around the drum sander, hooked over pins, and locked into a solid abrasive drum. The cone shaped locking washer keeps the sander halves together during operation and it is said to be entirely safe at speeds up to 6000 rpm.

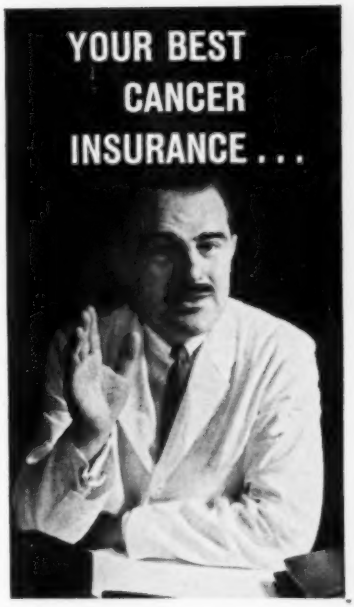
E—322. Magnetic Flow Meter—The magnetic flow meter manufactured by The Foxboro Co. is now available for ½-in. flow lines. It will be useful in ratio flow control systems where small flows are ratioed to larger ones.

The smaller meter is said to offer the advantages of the larger instruments such as over-all accuracy of 1 per cent of full scale throughout the entire scale, no restriction of flow, linear flow readings, and performance unaffected by pressure, viscosity, density or changes in conductivity of the flowing liquid.

The transmitter unit consists of a Teflon-insulated nonmagnetic flow tube containing flush-mounted metallic electrodes and surrounded by an ac electromagnet. When a conductive liquid passes through the tube, an alternating voltage is set up between the electrodes which varies linearly in proportion to the volume rate of flow. Lead wires from the electrodes transmit this voltage output to a dynalog recorder, producing a chart record in appropriate units of flow.

E—323. Filter Pumps—Sethco Mfg. Co. reports a new series of stainless steel, self-priming filter pumps for filtering corrosive solutions for continuous filtration, in and out of the same tank, transfer filtration or simple transfer of most acid or alkaline solutions.

This series consists essentially of a self-priming pump and a filter chamber. The pump is furnished with a by-pass valve which automatically opens during filtration when the pressure inside the filter chamber reaches 35 psi (due to the accumulation of impurities). The liquid is circulated inside the pump, completely by-passing the filter chamber. By-pass pressure can be adjusted from 20–50 psi. The motor furnished is ¼ hp, 1700 rpm, 115 v, 60 cycle, 1 phase, totally enclosed, ball bearing, capacitor start. Motor is wired with 3 wire grounding cord, feed-thru switch, grounding cap and adapter for 2 wire outlets.



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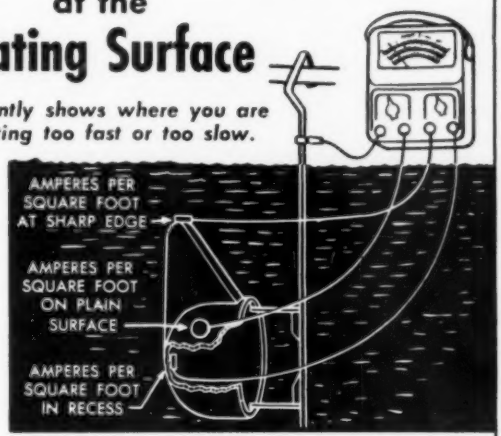

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NO FIGURING. Meter shows amperes per square foot — affords direct comparison with current density table for the solution you are using. Eliminates trial and error. Enables you to plate to specifications at lowest cost.

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L—301. Masking Aids—"Time Saving Masking Aids for Better Product Finishing" is the title of a new illustrated brochure issued by the By-Buk Co.

Overlapping masking discs in rolls and split-back discs are featured. A complete line of masking plugs, caps, corks, etc. are shown with new dimension tables to simplify size selection. Peelable plastic masking for application at room temperature or in molten form is shown.

L—302. Acid Copper Plating—CuSol, a new acid copper plating process is described in a technical paper prepared by Sel-Rex Corp. The CuSol copper plating process consists of two addition agents which may be used to "convert" existing sulfate or fluoroborate copper plating baths, as well as to make-up original baths.

It is reported that the CuSol copper plating process is expected to be of special interest to printed circuit manufacturers in that the process' acid base will not affect the laminate boards.

In addition to the various features of the process, the literature also covers such topics as preparation and maintenance of copper sulfate and copper fluoroborate baths, recommended temperatures, current densities and agitation.

L—303. Steam Cleaner—A two-page bulletin describing the Kelite fireless steam cleaner, is being offered by Kelite Corp.

The bulletin describes how the Kelite fireless uses live steam from an existing steam supply, thus providing the efficient cleaning power of high-volume steam cleaners.

The bulletin points out that maintenance of the machine is a simple matter since fire, soot, heat exchanger, scale, and special controls are eliminated.

In addition to illustrations of the cleaner and its steam gun features, the Bulletin P-7578 carries a table of specifications and a list of optional equipment.

L—304. Barrel Compounds—"Permag Compounds for Barrel Processing" is the title of a new manual prepared by Magnuson Products Corp. It is in manual form so as to be of maximum value to shop men and engineers. General descriptions of various processes will assist purchasing men for comparison purposes.

The manual is indexed to cover an introduction, general information, process information on 11 topics, and the work defined by numerous case histories. There are illustrations of typical units of equipment and media.

Miscellaneous information on calculation of volumes of octagonal and hexagonal barrels, an inquiry form to expedite responses to requests on information, and a listing of available compounds for barrel processing operations complete the manual.

L—305. Phosphating Compounds—Oakite CrysCoat No. 89, the iron phosphating compound that cleans and phosphates metal at the same time; and Oakite CrysCoat HC, the zinc phosphating compound designed to give a heavy coating in tank application are the subjects of two folders recently published by Oakite Products, Inc.

Used in spray washing machines or tanks, No. 89 converts the surface layer of steel into a hard, dense phosphate coating, weighing from 60 to 90 mg/sq ft. CrysCoat HC, designed for tank application, products a heavy weight coating of 150 to 1200 mg/sq ft, depending on the time of immersion. It meets Government specifications, and is recommended where finishes will be exposed to the elements.

L—306. Metallic Power Rectifiers—A fully illustrated, 32-page Guide to metallic power rectifiers, utilizing germanium, silicon and selenium semiconductors, has been published by Sel-Rex Corp.

The literature covers such widely varied applications for rectifier equipment as anodizing, battery chargers, electrocleaning, electroplating, aircraft ground power supplies, current limiting industrial rectifiers, shop power supplies and complete semiconductor power conversion systems for the operation of electrolytic cells.

For each application there is a detailed description, including operational characteristics, of the components used, such as semiconductor elements, transformers, output regulators, automatic remote controllers, magnetic amplifiers, etc.

L—307. Ultrasonic Cleaners—The first mass-produced line of high capacity, production-size ultrasonic cleaners, metal-finishing and chemical process machines, the Narda SonBlaster Series 600, is described in a new Data Sheet No. 600 just published by The Narda Ultrasonics Corp. The data sheet presents details of generator model G-601 and related transducers.

The data sheet includes photographs and technical information on transducer models NT-601 to NT-609, which cover two types of submersible transducers and seven different process tanks. Thirteen ultrasonic systems are described. The stainless steel tanks in this series range from ½ gallon to one gallon capacity with single or double tank compartments. Some feature inlet and outlet taps for hook-up with external recirculating systems; others feature self-contained recirculating pumps, filters and temperature controls.

Of interest is a list of 35 soils common to metal, glass, plastic, ceramic, stone, rubber, leather, textile and paper products parts and assemblies, which can be removed in seconds by ultrasonic techniques. Also mentioned are a number of metal-finishing operations for which the equipment is adapted; i. e., polishing, deburring, plating, etching, impregnating, brightening etc.

L—308. Chemical Milling—A new 10-page brochure describing chemical milling has just been made available by United States Chemical Milling Corp.

This up-to-date discussion on chemical milling describes such topics as: What is Chemical Milling; What Are Its Advantages; Application Check List; Metals That Can Be Chemically Milled; How Chemical Milling is Done; Productability; Chemical Milling Design Factors and Recommendations—complete with pictures and illustrations.

L—309. Corrosion Resistant Materials—A new catalog describes entire Ralph V. Rulon, Inc., line of corrosion resistant materials and corrosion resistant construction. Materials include: mastics for floors, acidproof brick, a complete line of chemically resistant mortars, impervious liners, and protective coatings.

L—310. Semiconductor Power Rectifiers—Bulletin GEA-6375A, 12 pages, discusses both silicon and germanium power rectifiers for use in electrochemical processes, aluminum and copper production, electroplating, anodizing, and steel process lines. The General Electric Co. explains how high efficiency conversion can be obtained at relatively low cost with semiconductor rectifiers; describes features and applications of water-cooled and air-cooled designs.

L—311. Semiconductor Rectifier Power Conversion Systems—Bulletin GEA-6684, 16 pages, discusses use of semiconductor rectifier systems for supplying d-c power for electrochemical processes, electroplating, anodizing, aluminum reduction, and copper refining. It explains advantages of systems approach, lists features of General Electric systems, describes four methods of meeting d-c power requirements for electrolytic processes, discusses application of power conversion systems, and provides technical data on performance characteristics of General Electric rectifier systems.

L—312. Mechanical Finishing—A new 24-page, 4-color catalog on precision metal finishing by mechanical barrel-finishing methods is now off the press.

Released by Roto-Finish Co., the new

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Trade Mark

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COATINGS for METALS
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Copper deposits now fit the need

Metal & Thermit now offers the most complete line of copper plating processes – has a deposit to meet all applications.

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Metal & Thermit bath uses entirely new addition agents for stability, more dependable operation

Users report that the new M&T Bright Cyanide Copper reduces operating costs and assures uniformly high plating quality with a minimum of control. The low cost solution can be made up with potassium, sodium, or a combination of the two salts.

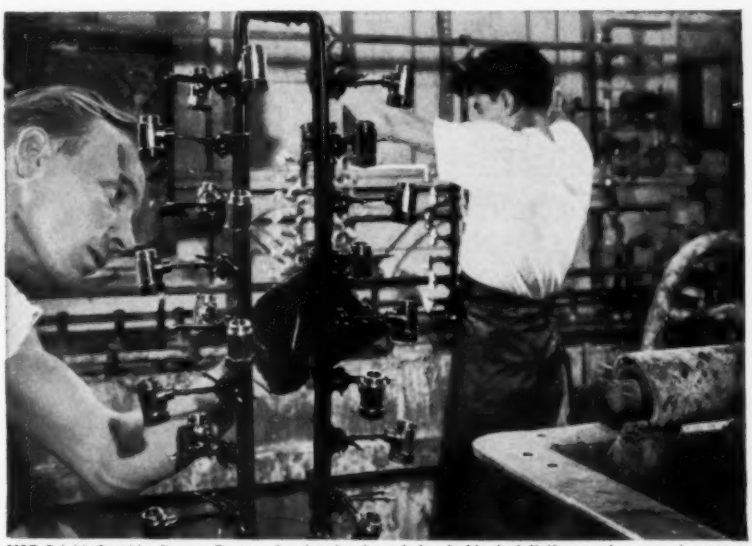
The cost of operation is low due to long life and stability of the addition agents.

The deposits may be mirror-bright, if desired, or of a lesser degree of brightness, depending upon the specific requirements of each installation. The stability of the solution has enabled platers to obtain brighter deposits with greater consistency than ever before.

A wide bright range at high cathode efficiency assures high rates of deposition without burning on edges or dullness in recessed areas. High current densities may be used.

The process provides excellent anode corrosion, utilizing a new bath additive, NEOCHEL, which replaces Rochelle salts. The exceptional stability of this and other additives assures freedom from difficulty due to the accumulation of decomposition products in the bath.

Process control has been simplified. Only one chemical determination and a single Hull Cell test are required for control of the additives.



M&T Bright Cyanide Copper Process is already at work in sizable installations and a proved success.
Photo courtesy Pottstown Plating Works, Inc.

publication sets forth an explanation of mechanical finishing processes. The story of how Roto-Finishing is applied to the grinding, deburring, descaling, polishing and coloring of metal parts contains information for process engineers. It answers some of the basic questions to the problem of achieving large-quantity production runs while maintaining exact tolerances and uniformity of finish.

Included are illustrations and descriptions of Roto-Finish equipment by model number, basic machine dimensions, compartment capacities, and recommended work loads. Standard accessories such as separators, controls, screens, chip bins, dip tanks, and centrifugal dryers are also listed.

A flow diagram showing a variety of special systems illustrates the many combinations of tailor made processes available for completely automating metal parts finishing on a large scale basis.

L—313. Fume Scrubbers—Clear pictures and vivid, detailed descriptions make a new bulletin on fume scrubbers produced by Heil Process Equipment Corp. both interesting and informative. The bulletin shows scrubbers used in chemical plants, metal treatment, electroplating, refining, acid pickling, anodizing, and in laboratories. Numerous kinds of construction are pictured, including solid plastic, reinforced plastic, rubber and plastic lined steel, and stainless steel. Cases are given showing both wet cyclone and packed tower types of scrubber. The bulletin offers information on CFM handled, corrosive agents removed by the scrubbers, and the industry or process in which each type of scrubber is employed.

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L—314. Belt Finishing Materials Chart—Selection of offhand belt finishing materials and equipment is simplified by means of an illustrated wall chart offered by Behr-Manning Co., division of Norton Co. Proper abrasives, grit, belt speed, lubricant and contact wheel are listed for 16 of the most popular metals and alloys.

Eleven types of contact wheels are described. Information includes types of surfaces, wheel action and the advantages of each type of contact wheel.

On durable card stock, the 15 x 27 in. chart is designed to be hung in tool rooms and work areas.

L—315. Printed Circuits Etchant—The new Becco process for etching printed circuits with a solution of ammonium persulfate instead of ferric chloride is described in a new Becco Bulletin, No. 90, just published by Becco Chemical Division, Food Machinery and Chemical Corp.

Advantages of the persulfate bath claimed over ferric chloride include: the etchant is relatively non-corrosive; sludge formation is avoided; only water-soluble reaction products are formed; solder-plated circuits can be etched; copper can be recovered from the spent etching solution; waste solution can be disposed of easily.

Preparation of the solution. processing instructions, after-treatment, and disposal of the waste solution are fully outlined in the new bulletin.

L—316. Sandblast Machines—A new four-page bulletin is available illustrating and describing the complete line of Leiman cabinet type sandblast machines for cleaning, deburring, surface preparation, stenciling and matte finishing on metal, glass, plastics and compositions. Included are standard cabinet type, automatic type with rotating basket inside cabinet, bench type cabinet model for laboratory and small shop, large cabinet type with portable blast nozzle for large pieces, plus a compact motor driven air compressor for plants having no air supply.

L—317. Metal Stripper—A liquid acid immersion stripper, which will remove from stainless steel or aluminum all coatings except heavy chromium and precious metals, is described in Technical Data Sheet No. 46, a three-page usage and instruction bulletin prepared by MacDermid Incorporated. Called Metex Metal Stripper SS, it is claimed to eliminate the expense and hazards of mechanical rack and tank stripping. Used as a regular step in the process cycle, the solution acts rapidly, leaves no etch and requires no current.

BOOKS

Remittance must accompany all book orders placed with AES Headquarters.

Development of a Nondestructive Test for Evaluation of Adhesion of Electrodeposits on Steel as in Silver-plated Aircraft Bearings. A. L. Walters and S. A. Wenk, Battelle Memorial Institute for Wright Air Development Center, U. S. Air Force. Nov. 1953. 65 pages. Order PB 131226 from office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., $1.75.

Reliable nondestructive test methods used commercially for inspection of silver-plated aircraft bearings are discussed. Selection of the test method depends on whether a copper or nickel strike is applied to the bearing shell before silver plating. The shot peening test, in which the surface of the silver plate is lightly shot peened under controlled conditions, is used principally on bearings having a copper strike. In the bake test, nickel strike bearings are tested by heating the bearing to 950 F, followed by rough boring, or machining to size and then X-raying the bearing surface. A summary of processing operating procedures for silver plating and bond testing at one industrial plant is included, together with plating and testing data for experimental panels processed at Battelle. The report also suggests changes in an Air Force Technical Order to improve the procedure for silver plating and reduce the occurrence of poorly adherent silver plate at USAF depots overhauling aircraft engines.

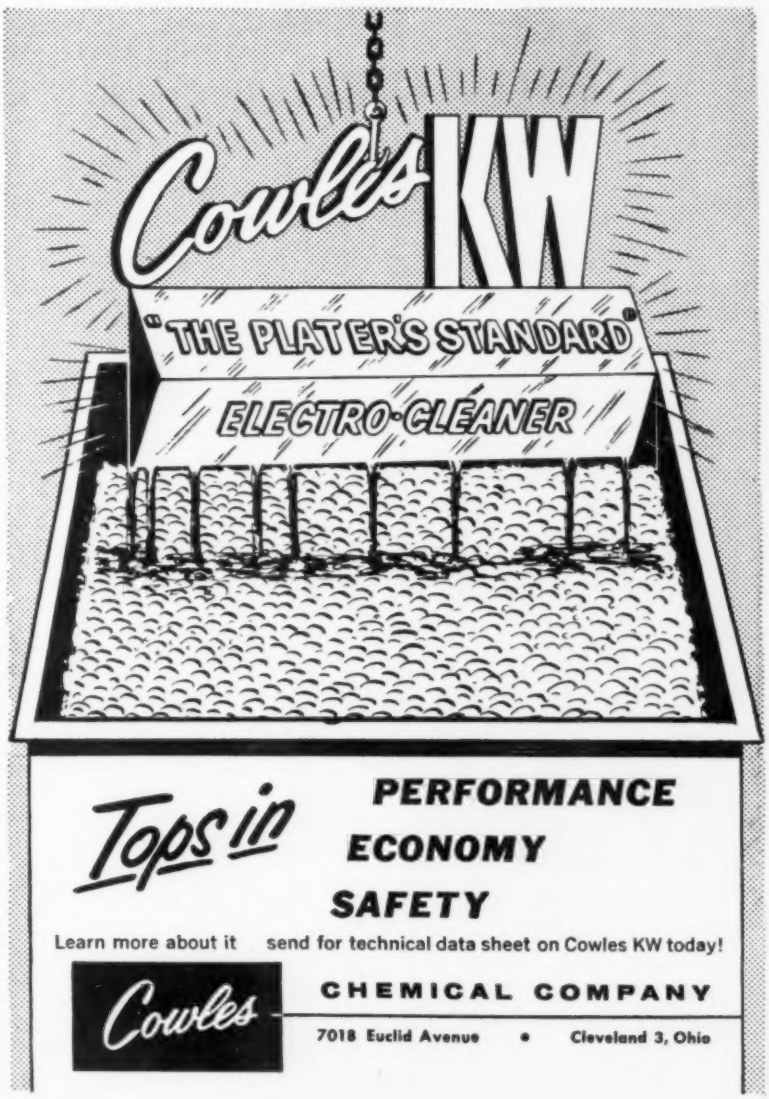
1957 Supplements to Book of ASTM Standards. Heavy paper covers; AES member $3.60 per part. Nonmembers $4.00 per part.

Part 1. Ferrous Metals—520 pages. Includes 80 standards covering steel pipe (welded and seamless), high temperature service, stainless, etc.; steel tubes (boiler, superheater, heat exchanger, refinery service, general service, etc.); steel castings; bolting materials; boiler and pressure vessel plate; structural and rivet steel; sheet and strip; forgings and axles; railroad wheels and tires; concrete reinforcement; metallic coated steel products; cast iron; spring steel; steel chain; and ferroalloys.

Part 2. Non-Ferrous Metals—380 pages. Includes 56 standards covering copper and copper-base alloys; aluminum and aluminum-base alloys; magnesium and magnesium-base alloys; electrical heating; resistance and related alloys for radio tubes; electrodeposited metallic coatings; die cast metals; corrosion tests and general methods of testing. (Presently available.)

Part 4. Paint, Naval Stores, Wood, Cellulose, Wax Polishes, Sandwich and Building Construction, Fire Tests—218 pages. Includes 33 standards covering pigments; drying oils; paint driers and thinners; shellac and varnish; lacquer and lacquer materials; general paint tests; wood; pigments; and sandwich constructions.

Part 6. Rubber, Plastics, Electrical Insulation—423 pages. Includes 70 standards covering rubber products (chemical, physical, aging, and low temperature tests); automotive and aeronautical rubber; packing and gasket materials; hose; insulated wire and cable carbon black; electronics materials; plastics (specifications; strength; hardness, thermal, optical, and permanence properties); analytical methods, molds and molding processes, definitions and nomenclature.



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ARTICLE REFERENCES

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Most of the articles listed here may be obtained by writing to the publications in which the articles were published. Addresses are given at the end of the references for the reader's convenience.

Photostat or microfilm copies of articles in available magazines may be obtained from: Library of Congress, Washington, D. C.; New York Public Library, New York; Engineering Societies' Library, New York, at prevailing rates. In other cases, consult Wilson's Union List of Serials at your nearest public library for other sources of these articles.

22. ALLOYS

a. *ELECTRODEPOSITION OF TIN-ZINC ALLOYS FROM STANNATE-COMPLEXONE SOLUTIONS.*
A. E. Davies and R.-M. Angles.
Institute of Metal Finishing, Transactions, *33*, 1955–56, pp. 277–285.

b. *ELECTROPLATING 22 KARAT GOLD-SILVER ALLOY.*
R. E. Harr and A. G. Cafferty.
Metal Finishing, *56*, No. 1, January 1958, pp. 55–57.

c. *ELECTROPLATING FROM THE PYROPHOSPHATE BATH. 2. ELECTRODEPOSITION OF ALLOYS.*
T. L. Rama Char.
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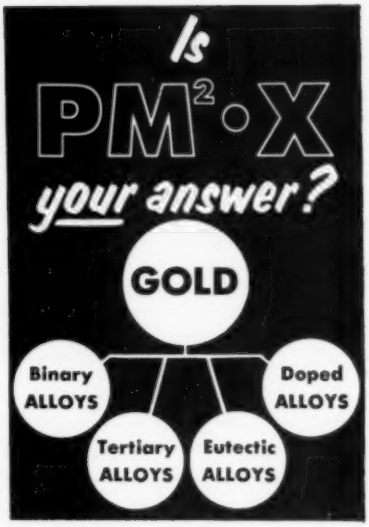
a. *EVOLUTION OF HYDROGEN DURING DEPOSITION.*
C. P. Brittain and G. C. Smith.
Institute of Metal Finishing, Transactions, *33*, 1955–56, pp. 289–305.

25. COPPER

a. *ACID COPPER PLATING ON*



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ALUMINUM.
J. T. N. Atkinson.
Journal of the Electrochemical Society, *105*, No. 1, January 1958, pp. 24–27.

26. CORROSION

a. *RESEARCH ON THE INFLUENCE OF ULTRASONIC WAVES ON METALLIC CORROSION.*
A. Reggiori and T. Songa,
Breda Instituto di Richerche Scientifiche Applicate, Milan, Italy. (Air Research and Development Command). U. S. Office of Technical Services, PB 121964, November 1956, 83 p.
"Equipment and techniques for corrosion tests of stainless steel and Armco iron in four conditions—stagnant, with ultrasonic waves, with mechanical agitation, and with mechanical agitation and ultrasonic waves. The presence of ultrasonic waves in the electrolyte increases corrosion rate. Tests with gas-saturated solutions showed this action to be connected with the presence of oxygen in the attacking solution. A magnetostrictive ultrasonic wave generator was built".

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Henry Weaver Jr. and Cecil C. Lynch.
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27. EQUIPMENT

a. *AUTOMATIC LOADER SPEEDS PLATING OF AUTO PARTS.*
Ralph L. Everstine.
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28. MISCELLANEOUS

a. *COMPRESSED AIR—AND ITS APPLICATIONS IN METAL FINISHING.*
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Metallurgie et la Construction Mecanique, *89*, September 1957, pp. 745–747.

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Heinz W. Dettner.
Industrie-Anzeiger, *79*, No. 64, August 9, 1957, p. 967.
"Chromium dip plating procedure is cheaper and simpler than the electorlytic process and has broad field for future development."

29. ORGANICS

a. *EPOXY COATINGS: PERFORMANCE AND APPLICATION DATA.*
Fred Grushoff.
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M. Svoboda and B. Knapek.
Korose a Ochrana Materialu, *1*, No. 1, 1957, pp. 3–6.

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J. C. Withers and P. E. Ritt.
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Dr. Paul H. Margulies.
Products Finishing, January 1958, pp. 54–57.

Corrosion
National Association of Corrosion Engineers
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No 1 Main St
Houston 2, Texas

Electroplating and Metal Finishing
15 Udney Park Rd
Teddington, Middlesex
England

Institute of Metal Finishing
32 Gt. Ormond Street
London, W. C. 1
England

J. Electrochemical Society
1860 Broadway
New York 23, N. Y.

J. Institute of Metals
17 Belgrave Square
London, S. W. 1, England

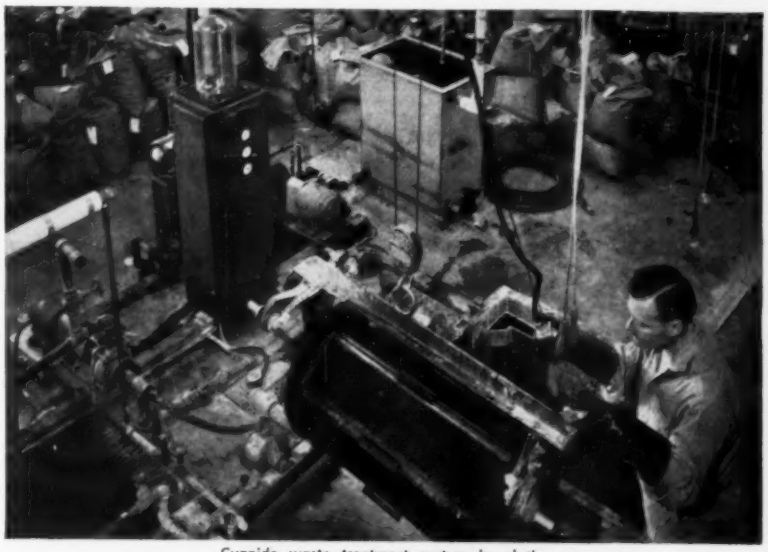
Metal Finishing
381 Broadway
Westwood, N. J.

Metallurgie et la Construction Mecanique
79, Champs-Elysees
Paris (VIIIe)
France

Products Finishing
431 Main St.
Cincinnati, Ohio

Tin and Its Uses
International Tin Study Group
7 Carel van Bylandtlaan
The Hague
Netherlands

United States Office of Technical Services
Washington 25, D. C.



Cyanide waste treatment system in plating room of the Palnut Co., Mountainside, N. J.

THIS SMALL PLATING PLANT BENEFITS FROM CHLORINATION IN TREATING PLATING WASTE

W&T Alkaline Chlorination solved the Palnut Company's problem of how to treat toxic cyanide plating waste effectively and cheaply. A flow-through process permitted installing the equipment right in the plating room. No new plant space was needed. In addition, because the treatment is simple to operate, one man runs the equipment as part of his regular work.

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PERSONALS

(Continued from page 279)

C. J. Martin

W. W. Lee

C. J. Martin, who has been Buffalo district sales manager of the J. B. Ford Division, Wyandotte Chemicals Corp. since December 1954, has been promoted to manage the Chicago District.

W. Wright Lee, formerly an Atlanta district field sales manager, has been promoted to manage the Buffalo district.

Frederick E. Burnham has been named executive vice president and a member of the board of directors of George L. Nankervis Co., recently acquired by Peninsular Metal Products Corp.

Harold M. Cherry, executive of the company since 1944, came out of retirement a year ago, upon the death of George Nankervis, to take over management responsibilities. He has now agreed to stay on as vice president in charge of the metal finishing division.

Henry W. Grikscheit, recognized authority on aircraft and automotive engine test facilities and who expanded the activities of the company into this growing field, will continue as sales vice president and a member of the board.

H. W. Grikscheit

V. G. Converse, III

Vernon G. Converse 3rd, with Nankervis since 1950 in various manufacturing and management positions, is now vice president in charge of manufacturing.

Kemble S. Lewis, sales manager of the Plastics Division of Diamond Alkali Co. since October, 1954, has been named to head the newly-formed sales market research group of its commercial development department.

Harry H. Redlich, technical service representative at Painesville for Diamond's Chromium Chemicals Division since August, 1954, joins the same department as division market analyst.

Robert R. Fuldauer joins the organization as market analyst from the accounting department, where he has been engaged in trade analysis work for the past six years.

John V. Lawler, active since 1953 in sales and market analysis for E. I. Du Pont de Nemours & Co., Inc., Wilmington, Delaware, joins the department as a market analyst.

William E. Bryan has joined Acme Electric, Cuba, N. Y. as sales manager of the custom equipment section.

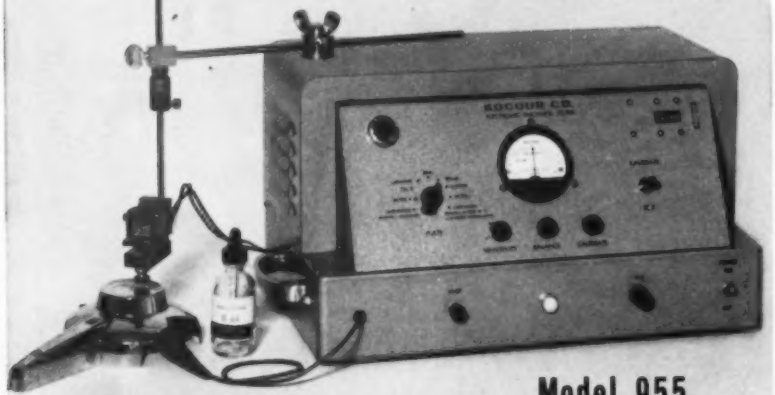
After training at the University of Pittsburgh, he was previously associated with American Machine and Metals, Inc., and had been sales director of Rapid Electric Co. of New York.

Max B. Roosa, formerly vice president in charge of sales, has been elected executive vice-president of Parker Rust Proof Co., Detroit.

Mr. Roosa has been with Parker since 1936, joining the company after graduating from the University of Michigan with a degree in chemical engineering.

Beginning as a research chemist, he has held progressively more important positions in the sales and service departments. He was made sales manager in 1951 and vice president in charge of sales in 1952.

KOCOUR Electronic Thickness Tester



Model 955

Here's a NEW thickness test for COPPER over ZINC DIE-CAST

We are proud to announce the addition of an important new test to the applications of the Kocour Electronic Thickness Tester. You can test copper over zinc die-cast with all the advantages of the instrument, including direct readings in hundred-thousandths of an inch.

MODEL 955 virtually eliminates human error

The human elements affecting accuracy have been virtually eliminated with simple automatic operation . . . direct readings . . . reproducible results . . . calibration adjustment and thickness standards to verify satisfactory operation. At every point the Kocour Electronic Thickness Tester proves itself to be a reliably dependable method providing accurate results . . . truly a basis on which both buyer and seller of plating can rely. Get the details today!

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J. P. Melhado

W. G. Sittmann

Walter G. Sittmann, formerly Oakite Products' Pittsburgh division manager, has been transferred to head the new Upper New York State Division, which comprises the technical field representatives and warehousing facilities in Albany, Utica, Syracuse, Binghamton, Elmira, Rochester, Buffalo, and Scranton, Pennsylvania. Mr. Sittmann, a veteran of twenty-one years service with Oakite, was for seven years field representative in northern Indiana before his appointment as Pittsburgh division head in 1953. He has established his office at Fitch Building, 315 Alexander St., Rochester 4, N. Y.

John P. Melhado, formerly a field representative in New York City, replaces Mr. Sittmann in Pittsburgh. Mr. Melhado joined Oakite in 1949 after many years as a superintendent in metal finishing shops.

The new Mid South Division consists of Oakite representatives in Cincinnati, Nashville, Little Rock, Knoxville, Louisville, Evansville, Jackson, Shreveport, Memphis, and New Orleans. **Victor L. Baltzell,** representative in Dallas for the past fifteen years, is manager of the new division. He is headquartered at Commonwealth Building, 4th and Broadway, Louisville 2, Kentucky.

V. L. Baltzell

Dr. J. V. Petrocelli

Dr. Joseph V. Petrocelli has been appointed head of the electrochemical section of the International Nickel Company's Research Laboratory at Bayonne, New Jersey, according to an announcement by Dr. W. Andrew Wesley, manager of the laboratory. Formerly director of research and development for The Patent Button Company, Waterbury, Connecticut, Dr. Petrocelli joined the Bayonne laboratory staff on August 1, 1957, as a research electrochemist.

In his new capacity, Dr. Petrocelli directs activities in the principal fields of study such as improvement of existing processes of nickel plating and plating of nickel alloys, the development of new plating processes, study of the mechanism of corrosion of electrodeposits, study of the microstructure of electrodeposits, and development of new engineering applications for chemically reduced and electrodeposited coatings of nickel and nickel alloys.

Dr. Petrocelli holds the MA and BA degrees from Wesleyan University, Middletown, Connecticut, where he majored in chemistry. While attending the graduate school, he majored in physical chemistry and minored in mathematics. Dr. Petrocelli obtained the PhD degree in physical metallurgy from Yale University, the subject of his thesis being "Electrodeposition on Zinc Base Die Castings."

He has served as chairman of the Corrosion Division of the Electrochemical Society, Corrosion editor for the Journal of the Electrochemical Society for several years, and is a former president of the Waterbury Branch of the AES. The author of several papers in the fields of electrodeposition, corrosion and polarography, he has also served as discussion leader of some Gordon Research Conferences.

Dr. Petrocelli is a member of the American Association for the Advancement of Science, the Electrochemical Society, American Chemical Society and American Electroplaters' Society. He belongs to Sigma Xi and the Sigma Nu fraternities.

Every batch checked. Every can filled with a full weight of extra high quality 99.75+% Chromic Acid. Prompt delivery from ample factory and nearby distributor stocks. Why not order BFC Chromic Acid next time?

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BRANCH NEWS

Total AES Branches U. S., Canada Australia, March 1, 1958—58.

BRIDGEPORT

Drive for New Members; Schneiders Speaks on Rectifiers

The regularly scheduled business meeting and educational session was held in the main ballroom of the Hotel Barnum on Friday, Jan. 10.

President **Tatum** called the meeting to order with 30 members present.

One application for membership was received and one new member elected.

George Eckholm reported the Christmas dinner-dance was a financial and social success and thanked his committee for their efforts.

Al Ferguson and Floyd Tatum reported that progress is being made for entertainment at the New England Regional. Consideration is being given to the possibility of holding a fashion show through the cooperation of one of the department stores in Hartford.

Emil Bergen reported the completion of plans for Old Times Nite. The date is Feb. 22, at the Viking Hall on Alfred St., Bridgeport.

The per capita tax revision for the forthcoming 15 months as recommended by the National committee appointed by **Frank Eddy,** President, was discussed. A motion was made and passed to adjust our dues for the aforementioned period.

A letter from the Grand Rapids Branch asking for Bridgeport's support of the candidacy of **George Borlet** for third vice-president of the National Society was tabled for consideration at our May meeting.

Al Ferguson, reported that the members were favorably inclined towards the holding of a summer outing. **Henry Maskowski** was appointed acting chairman of the committee, to be selected by him.

Joseph Haas accepted chairmanship of a committee to draw up a constitution and bylaws for the branch.

Allen Ferguson, second vice president, discussed ways and means of increasing Branch membership. He appointed **Herman Braun,** Joe Haas, **Edmond Owen** and **Hugh Morris** to be his aides in their respective home areas. He suggested that the February meeting be designated as "Guest" night and asked for the cooperation of all members by bringing a guest at that time.

The door prize was won by the Squire of Trumbull, George Eckholm.

The meeting was turned over to **William Hyatt,** librarian, who introduced the featured speaker of the evening. **Francis A. Schneiders** of Enthone, Inc. Mr. Schneiders discussed the functions of each component of a rectifier. All components were exposed to the viewer and through the use of an oscilloscope the variables in the wave pattern of the rectified current were reproduced. His informal and very informative talk was interspersed with many questions from the floor which were answered in detail. He was given a rising round of applause.

Bob Parker

BRITISH COLUMBIA

Weisberg Talks on Precious Metal Plating

The meeting was held Jan. 15 at the White Spot.

Letters from **Frank Virgil,** Los Angeles Branch; Metal & Thermit and International Nickel regarding future speakers were read.

There was a short discussion regarding meeting attendance which concluded with the suggestion that card notices by mail be followed up by phone calls made by a rotating committee.

There was also a short discussion regarding the proposed Seattle joint meeting which is now tentatively scheduled for March.

Gordon Smith offered to contact **Prof. Armstrong,** Mining & Mettallurgy, Dept. U. B. C. as a possible speaker for the next meeting.

President **Bill Marquardt** introduced the speaker of the evening, **A. Weisberg** of Technic, Inc. Mr. Weisberg's talk covered various aspects of the precious metal plating industry, both jewelry and electronic applications. As this was a completely new field for most of the members much interest was shown and following his talk Mr. Weisberg answered many technical questions.

Jim Lee
Secretary

CAPITOL DISTRICT

Hightower Explains Ultrasonic Cleaning

The January meeting was held at the Hot Shoppe in Loudonville, Monday evening, Jan. 6. After much confusion due to conflicting scheduling of arrangements by the management, during which a substitute meal was served and a substitute meeting room was found unsatisfactory, we finally settled down in our regular meeting room to enjoy an interesting talk by **Dr. Hightower,** of Branson Ultra' sonics Corp., on "Ultrasonic Cleaning,'- illustrated by slides, and a demonstration of the actual equipment by **Norman Alexander** of the Redford Corp., Schenectady, N. Y.

Dr. Hightower explained that ultrasonics in cleaning has advanced considerably in recent years due to chemical advances in solutions and new materials available to build better units more resistant to erosion and corrosion in operation, as well as to engineering advances in research and design. Results not heretofore possible are being obtained in the cleaning of intricate parts by using the proper cleaning solution and the proper ultrasonic range to obtain the optimum action and cleaning. He also stressed adequate rinsing following the ultrasonic cleaning to rid the work of the loosened soil. In some instances "ultrasonic" rinsing is also advocated. To eliminate objectionable noises of operation encountered in units operating around 20 kilocycles, a range of around 40 kilocycles is now being used which is well above the range of the human ear.

Many different arrangements of transducers were shown on slides, as well as before and after photos of actual cleaning under various conditions including some automation installations.

It is evident that ultrasonics in cleaning has come into its own, while ultrasonics in the plating bath itself has not as yet been definitely proven and much more research in this application is yet to be accomplished.

To close out the educational portion of the evening, Dr. Hightower held a question and answer discussion period which was actively participated in by members.

Due to the delays encountered in getting the evening started, a shortened business meeting was called by President **Bob Wolf.** A new member was accepted.

John H. Green
Recording Secretary

CENTRAL MICHIGAN

Nobel Talks on Cyanide Copper Plating

The Branch met at the Hotel Hayes in Jackson, Michigan on Tuesday evening, Jan. 7. It was a combined dinner meeting and educational session. One of the largest turnouts at a regular monthly meeting in many months occurred with 40 members and guests in attendance.

R. K. Martin librarian, introduced the speaker for the educational meeting, **Fred I. Nobel** of Lea-Ronal, Inc. Mr. Nobel spoke on the topic "Bright High-Speed

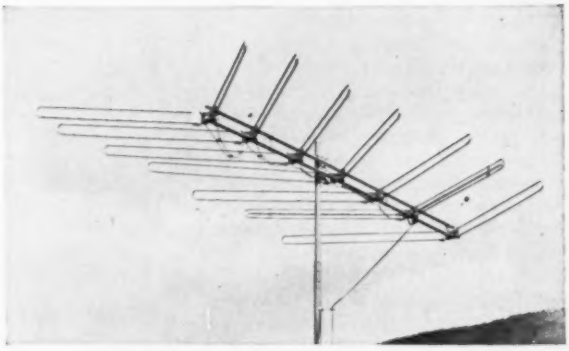
$2,000 a Month Saved By Channel Master!

By Using Ion Exchange To Purify Chromic Acid Bright Dip

Channel Master Corp., of Ellenville, N. Y., is the world's largest manufacturer of television antennas and accessories. One important reason for this leading position in a new and highly competitive field is the extremely high quality they have set for all their products.

One of these standards requires that the antenna withstand the corrosive effects of weather during its years of service. Although the antennas are primarily made of aluminum, steel clamps used in assembly can be affected by weather. In order to protect these steel parts and other vital accessories, such as mounting brackets and insulating hardware, from corrosion, they are first zinc plated and then dipped in a chromic acid type bath and sent through rinsing and bleaching baths to give them a bright finish. The bright dip bath loses its bite rapidly — affecting quality and requiring either discharge or treatment.

Channel Master's modern plant located in the heart of New York's resort area



Channel Master TW fringe area antenna.

Channel Master thoroughly investigated all known methods of treatment to find the one most suitable for their needs. They finally chose a Graver Ion Exchange system tailored to fit into the overall plating operation. This system restores the original bath quality and eliminates bath dumping. The equipment has now been in operation for over two years.

Results

- $2,000 a month saved by Channel Master using Graver Ion Exchange
- Difficult waste disposal problem solved
- Better rinsing from demineralized water

Write for Technical Reprint T-143 describing the operation of above system and Bulletin WC-111 describing Graver Ion Exchange Systems.

GRAVER

Industrial Waste Dept. W-511

GRAVER WATER CONDITIONING CO.

Division of Graver Tank & Mfg. Co., Inc.

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Cyanide Copper Plating." The information on this phase of plating was most complete and it was evident that Mr. Nobel was thoroughly familiar with the process outlined. Any and all questions following his talk, were clearly and completely answered.

R. W. Boos, Branch president, conducted a short business meeting.

Refreshments were served following the meeting.

Homer E. Welch
Third Vice President and Publicity Chairman

CHICAGO

Job Shop Panel Covers Many Phases

The Chicago Branch held their regular meeting at the Western Society of Engineers, Friday, Jan. 3. The speakers for the evening were **L. M. Glassner,** secretary of the Chicago Platers Institute; **Lawrence J. Hay,** Plating Service Co.; **Chester J. Kennedy,** American Buffing and Processing Co.; **Phil J. Ritzenthaler,** Plating Engineering Co.; and **C. Edw. Smith,** B. Mercil & Sons Plating Co. The subject for the evening was a panel discussion of "The Role of the Job Shop Plating Industry in our Industrial Area".

Mr. Glassner commented on the various functions the Chicago Platers Institute performs for the plating industry. The Institute furnishes the industry data on current topics of business management, labor, cost analysis, and personnel relations. The Institute has a directory of the job shops affiliated with the Institute and also works in conjunction with the Chicago Branch to promote the role of plating in industry. The Institute has copies of the different specifications regarding metal finishing.

Mr. Kennedy discussed the various types of polishing and buffing machines in our area doing specific jobs on various metal parts.

Mr. Ritzenthaler discussed the various special finishing processes a job shop may be called on to perform, such as the electropolishing of intricate parts, electroforming of materials for special applications, the build-up of materials with hard chrome and nickel, nickel cladding, and protection of equipment from corrosion by heavy plating with nickel.

Mr. Smith, the last speaker of the evening, spoke on the role of the job shop in the plating of small parts in large volumes, short run production items, plating of materials when time is of the essence, and the cooperation of the job shop with industrial concerns on plating problems. The job shop does play a vital part in the metal finishing field in our industrial area. An informative question and answer period followed.

Christopher Marzano
Publicity Chairman

Photograph courtesy of Products Finishing

CHICAGO'S 46TH ANNUAL EDUCATIONAL SESSION PARTICIPANTS
Speakers and Branch officers at the annual affair, January 25, at the Conrad Hilton Hotel, left to right, Dr. Neil Berst, Diversey Corporation; Dr. Harry E. Evangelides, Frankford Arsenal; R. Scott Modjeska, Program Chairman; Charles McCann, Social Research, Inc. and Dr. Russel E. Harr, Chicago Branch President.

Capitol Records cuts costs and simplifies plating of record masters with "Plus-4" Anodes

Capitol RECORDS

In its big, modern plant at Scranton, Pa., Capitol Records, Inc., produces record masters by acid-copper electroplating. To improve and simplify this critical step in making its high-quality popular and classical records, Capitol tried "Plus-4"® Anodes, Anaconda's phosphorized copper anodes. Chemical Engineer T. Melioris reports these operating results:

1. Material savings. Because there are no free particles of copper in the solution from "Plus-4" Anodes—sludge losses were cut 90%—copper sulfate build-up in the solution was drastically reduced. There has been an annual saving of several thousand pounds of salts and a big reduction in the amount of acid required.

2. Maintenance savings. In tanks using "Plus-4" Anodes, solutions are tested only every other week compared with twice a week for ordinary anodes. "Plus-4" Anodes need not be removed from the tank after plating is completed, as they do not continue to give off copper crystals to the solution after the current is stopped. Less frequent cleaning of tanks to remove sludge.

3. Smoother, denser deposits in tanks with "Plus-4" Anodes because there are relatively few finely divided copper particles suspended in solution.

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CINCINNATI

Lindemann, Smith, Weber and Roof Form Panel

The meeting was called to order by President **Loveless** with 44 members and guests present.

Four applications for membership were approved.

Ezra Blount gave a report on the Interim Meeting at Indianapolis and reported that the Executive Board was satisfied with the progress on the Convention.

Bob Rarick reported that the Joint Annual Meeting of the Technical and Scientific Societies Council would be held at the University of Cincinnati on Feb. 21. He urged all members to attend this function.

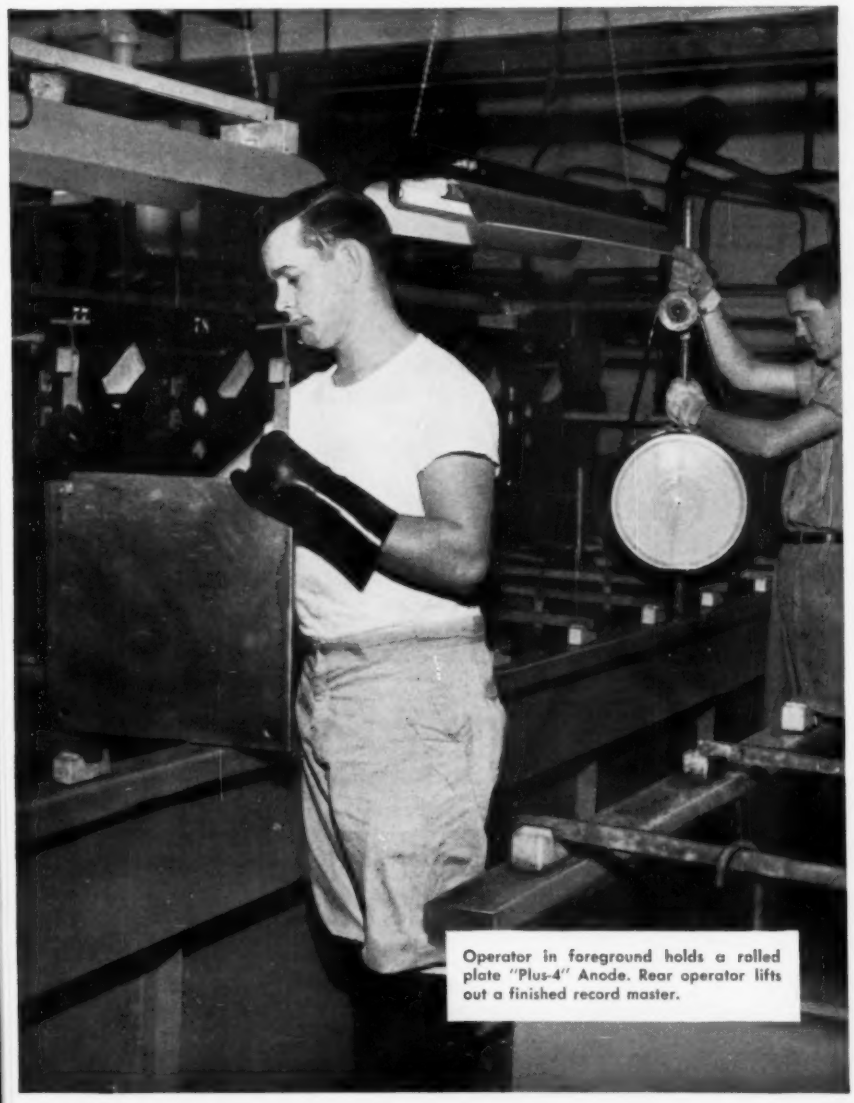
A motion was unanimously carried to permit the present officers to hold their positions until after the 1958 National Convention. The elections will be held in March as usual.

The secretary reported that the fiscal year beginning April 1, 1958, would be 15 months in duration to carry out the motion passed at the Montreal Convention to change the fiscal year to July 1 through June 30.

About once every other year the Cincinnati Branch has a panel discussion at one of its meetings. The panelists are usually the local "experts" in the finishing industry. This year the panel consisted of: **Bernie Lindemann** of Nutone Inc. on "Anodizing Aluminum"; **Harold F. Smith** of Smith Electrochemical, "How to Run a Job Shop"; **Robert C. Weber** of Micro Metal Finishing Co., "Mechanical Finishing"; and **Ed Roof** of Varland Metal Service, "Plating of Zinc Die Castings".

Each panelist gave a brief discussion of his topic and then the Branch started firing questions. After about an hour and a half a halt was called to the proceedings and the group adjourned to the Social Hour sponsored by the Herbert Chemical Co., **Bob Stringer,** host.

David L. Kaplan
Secretary



Operator in foreground holds a rolled plate "Plus-4" Anode. Rear operator lifts out a finished record master.

CLEVELAND

Electrocleaning Explained by Lux

The January meeting of the Cleveland Branch was held in the Oak Room, Hotel Carter, on Jan. 10. **Jim Kline,** a representative of the Cleveland Engineering and Scientific Center presented a talk on the progress to date of the Center building. He made a special plea for each member of the Branch to contribute to the Center. Explanation was given that many of the foundations that are willing to aid the project financially want to see a greater expression of interest on the part of the 13,000 members of the societies making up the Cleveland Technical Societies Council. The Cleveland Technical Societies Council includes in its membership the Cleveland Branch. The operation of the Center will be conducted by the Cleveland Engineering Society.

The technical session was devoted to a talk on "Some Fundamentals of Electrocleaning" by **G. A. Lux** of Oakite Products. Mr. Lux's talk was well illustrated with demonstrations of chemical and physical principles which must be considered in the formulation of a good electrocleaner. A number of interesting charts also served to make the talk clearly understood.

The business session was presided over by President **Morton Van Loan.** The slate of nominees for the forthcoming election was presented by the nominating committee. **Henry Friedberg** served as chairman of the committee.

The door prize was won for the second month in a row by **Joe Zehnder.**

Gordon H. Carlson
Assistant Librarian

COLUMBUS

Alt Presents Chemical Milling

The regular monthly meeting was held at Battelle Memorial Institute on Friday, Jan. 10.

The business meeting was called to order by President **Calvin Smith.**

A letter from LCDR **Daniel Howland** was read which asked for a copy of our meeting announcements every month so that members of Naval Research Reserve Company 4-7 could occasionally attend our meetings. They are requesting this of all the technical societies in Columbus so that the members of the Research Com-

pany can become familiar with a wide range of scientific fields. A motion was approved that the announcements should be sent.

Librarian **Jack Spenard** introduced the speaker of the evening, **L. L. Alt**, the Diversey Corp., Chicago, whose subject was "Chemical Milling." Mr. Alt gave a very interesting talk on the various aspects of chemical milling of aluminum and magnesium.

Halvor S. Christianson
Secretary

DAYTON
Critchfield on Quality Control

The Dayton Branch held its regular meeting on Jan. 15 at the Hotel Biltmore. Twenty-five members and guests braved very bad weather to attend. Four new members were elected. Announcement was made also of the recent death of **J. G. Walker,** representative, United Chromium, Div. Metal & Thermit, Inc. Mr. Walker had been a member of the Dayton Branch since May, 1947.

Our speaker for the evening was Branch Member, **L. A. Critchfield,** sales engineer, R. O. Hull Co., Rocky River, Ohio and the topic was "Quality Control in the Plating Room". This was an excellent presentation and supported by many slides.

Refreshments after the meeting were also through the courtesy of Mr. Critchfield and the R. O. Hull Co.

R. M. Clinchens
Secretary

DETROIT
Microthrowing Power Presented by Leidheiser

The fifth meeting of the 1957–58 series was held on Friday, Jan. 3, in the Michigan Room of the Statler Hotel. This was a joint meeting with the Electrochemical Society and was opened by the AES Detroit Branch president, **Glen H. Friedt Jr.** In his opening remarks Mr. Friedt commented that one member of the Branch, of 15 years standing, was attending his first meeting. This member, **William Toller,** of Houdaille Industries, Inc., resides in Huntington, West Virginia, and for the first time he was able to take advantage of one of our fine meetings, which, by the way, cost about one dollar per person. Why don't you members who live in closer proximity take in the next meeting and bring a fellow member.

Secretary **Ed Kubis** introduced six applicants for membership and they were elected. Mr. Kubis announced that any member seeking employment or employes has the privilege of placing an advertisement in PLATING Magazine and Ed can be contacted for details.

Educational Chairman **Doug Thomas** introduced the technical chairman of the Electrochemical Society, **Dr. Ed Remick** of Wayne State University. Dr. Remick invited all members interested in attending a joint meeting of the Electrochemical Society and the National Association of Corrosion Engineers to hear **Dr. Charles Faust** of Battelle Institute give a lecture on the "Fundamentals of Corrosion Protection by Metallic Coatings".

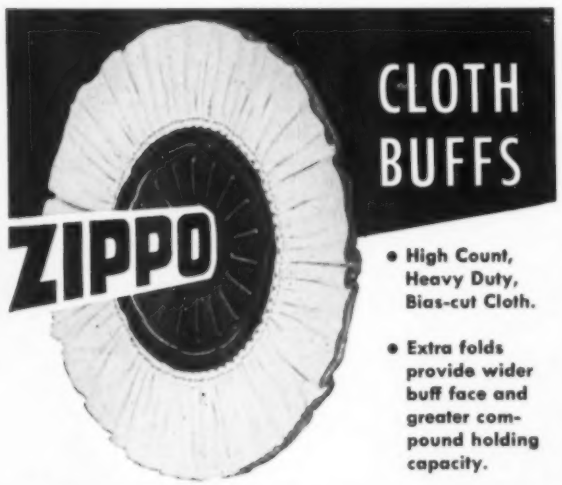
Dr. Henry Leidheiser Jr., of the Virginia Institute of Scientific Research of Richmond, Virginia, the evening's guest speaker, was introduced by Dr. Remick. The subject for the evening "Fundamental Studies of Micro-throwing Power and Leveling" was very ably presented and illustrated with numerous slides to demonstrate leveling action and plating in cracks and pores of varying sizes and depths.

The meeting adjourned at 10 p. m. at which time refreshments were served.

Robert J. Amis
Publicity Chairman

GRAND RAPIDS
Unterkufler and Hetrick Heard; Meet with ADCS

The first annual joint meeting of the Grand Rapids Branch, AES, with the Grand Rapids Branch of the American Die Casters' Society was held Dec. 10,



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SPEED-UP your nickel stripping **PROTECT** the base metal with **STRIPODE**

A proved addition agent, STRIPODE strips nickel plate faster and protects the base metal from pitting, roughening and etching. Also saves on use of acid, eliminates need of sand blasting or heavy buffing operation. Try it!

ORDER A TRIAL GALLON!

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USE READER SERVICE CARD; INDICATE A 358.

1957 at the Schnitzelbank Restaurant with approximately 110 persons in attendance. **Duke Wysong** attended the meeting with a group of engineers from the Studebaker-Packard Corp.

Speaker for the evening was **A. K. Unterkufler,** chief design and tool engineer for Ternstedt Central Division of General Motors Corp. The topic of his talk was "Evolution of Die Castings." Preceding his talk Mr. Unterkufler showed a film entitled "How Would You Make it Better" depicting some of the wide range of applications to which die castings are applied and some of the design problems which are encountered. In his talk, Mr. Unterkufler, illustrated some of the problems that the tool design engineer faces in carrying out the wishes of the designer with drawings of specific dies. He then outlined some of the things that can be done in getting the designer, tool engineer, buffer and plater together and making them aware of each others problems.

The January meeting was held on Jan. 10, at Finger's Restaurant with 55 members in attendance. First Vice President **Paul Waalkes** conducted the meeting in the absence of President **Dick Watson** who was attending the Interim Meeting of the Supreme Society with 2nd Vice President **Don Smith** and Treasurer **Chet Borlet.**

Applications of two men for membership were approved by the body.

The meeting was then turned over to the librarian, **Orville Hoxie,** who introduced the speaker, **George Hetrick** of the Electrochemical Div., E. I. du Pont de Nemours. His topic was "Metal Cleaning and Cost Analysis". Mr. Hetrick listed and evaluated some of the more important considerations which should be considered in selecting a cleaning system, both from an efficiency and cost point of view.

After the talk by Mr. Hetrick there was a panel discussion. Members of the panel were **A. L. Baske** of G. S. Blakeslee & Co., Mr. **Mac Namara** of the Detrex Corp., **K. Fish** of Du Pont in addition to Mr. Hetrick. The panel received many questions from the group and the evening proved very productive for everyone.

Don Smith
Publicity Chairman

INDIANAPOLIS
Murray Speaks on Stripping Electrodeposits

The Branch met at Fox's Steak House on Dec. 4, with 29 members and guests attending. President **Bert Hawhee** opened the meeting with introductions and immediately turned the proceedings over to our librarian.

Addison Howard introduced **Bill Murray** of Enthone Inc., who spoke on "Stripping Electrodeposits". Every plater at some time needs to know how to re-work plated parts without destroying or pitting the base part. Sodium cyanide with reverse potential of 1½–4 volts is satisfactory for most steel or steel alloy base parts. Copper can be stripped from zinc die castings by sulfiding the copper and brushing off the loose sulfide. Many other metal combinations were presented with details for handling each of them.

Marvin Sternagle called to our attention that **R. O. Hull** had died the previous Friday. Mr. Hawhee read the announcement from the Chicago Branch about their meeting on Jan. 25.

Mr. Howard advised that a barber shop quartet has been engaged to entertain at the Jan. 10 meeting and that **R. C. Gibson** of Parker Rust Proof Co. will talk on "Phosphate-Coating of Metals".

Paul Freeman

INDIANAPOLIS
National Officers Attend; Gibson Is Speaker

The January meeting was held at the Marott Hotel on Friday, the 10th, to cooperate with the National AES 5th

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Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.

Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.

Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.

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Interim Meeting held the following day. Eighty members and guests attended the Smörgasbord dinner and meeting.

Bert Hawhee introduced our honored guests **Francis T. Eddy, Herberth E. Head, Ralph D. Wysong, Dr. W. A. Wesley, Dr. Samuel Heiman** and **John P. Nichols.** Introductions of branch members and visiting guests followed.

Six applications of new members were read by our president. **Les Reynolds** made a motion, which was seconded and carried, that they be accepted.

Les Reynolds moved that the Branch recognize with a moment of silence the passing of our fellow member, **Lowell S. Fisher.**

Richard Watson, president of Grand Rapids Branch, invited all present to attend their meeting on Feb. 15. Feb. 14 and 15 are also the dates of the regional meeting at Atlanta, Georgia.

Addison Howard presented the Ko-ordinators, a barber shop quartet, who sang five numbers which everyone enjoyed.

For the educational program, Mr. Howard introduced **R. C. Gibson** of Parker Rust Proof Co. whose subject was "Phosphate Coating of Metals." Mr. Gibson pointed out four fields of application of phosphate coatings. 1) Corrosion resistance; nuts, bolts, washers and similar steel items. 2) Paint base; auto parts, refrigerators, steel cabinets, etc. 3) Reduce wear; pistons, rings and other parts. Phosphate treatment makes ideal surface conditions for holding oil films. 4) Base for soap-type films used in deep drawing dies.

Using slides Mr. Gibson gave a very good picture of how to use phosphate coatings. Questions and answers followed.

Paul Freeman
Secretary

KANSAS CITY

Garrett Reports on AES National Affairs

The Branch held its regular meeting Thursday, Jan. 16, in the Berkshire Hotel.

Sixteen Members and three guests enjoyed a delicious dinner. Later, after two more members and one additional guest had joined the group, the meeting was called to order by President **George Becker.**

Secretary **Robert L. Garrett,** a member of the National Membership Committee, gave a report to the Branch on the activities of that committee, also a report on the business of the Interim Meeting of the Supreme Society held in Indianapolis on Jan. 11. He explained the forthcoming change in the Society's fiscal year, the need for action on the Branch Bylaws and gave a preliminary explanation of the billing for the 1958–59 dues.

A report was also given on the Industrial Waste Conference held at City Hall in Kansas City. Brief discussion ensued on the results of that meeting and how it affected the members of this industry. The secretary promised that when the transcript of the meeting was available it would be submitted to the membership.

The meeting was turned over to Librarian **Scott Sterrett,** who introduced the speaker of the evening. He presented **Dwight Bedell** of the Kansas City Chamber of Commerce, who spoke on the subject "Industrial Growth in the Kansas City Area". He outlined the work of his organization in the promotion of new industries, enumerating both the assets and liabilities which this community has to offer to a prospective new business. He gave facts and figures on how industry

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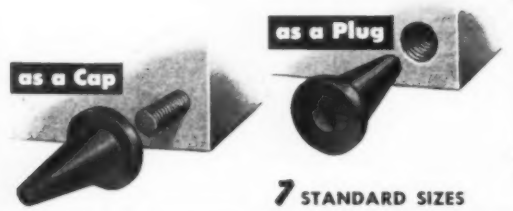

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affects the economy of a city this size. In the discussion which followed his talk, he answered questions on how new industries are promoted, why some have not chosen to move here, and what individuals and business can do to further the industrial growth of the community.

Some of his talk was tied directly to the report on the waste conference previously given with regard to how problems are solved jointly by several municipal governments such as exist in the Greater Kansas City Area.

Robert L. Garrett
Secretary

LANCASTER

Morgan Speaks at Well Attended Meeting

Our January meeting was held in the Lincoln Woods Inn, East York, Pennsylvania with 47 members and guests present. It was one of the best attended educational meetings in some time.

During the business meeting, **William Fordney** was elected to the Board of Managers to replace **R. Vines** who has moved. One application for membership was presented for Branch approval giving the Branch eight new members and one potential member since the Fall of 1957.

Librarian **P. Sharretts,** introduced **Tom Morgan** of the Reynolds Company, Philadelphia, who gave an interesting talk on "Bright Coppers". A discussion period on proprietary bright coppers in use at the present time concluded our program.

Robert S. Plaisted
Secretary

LOUISVILLE

Bruck Reports Interim Meeting; Rehme is Speaker

The regular monthly meeting was held on Thursday, Jan. 16, at Hasenour's Dining and Cocktail Lounge. Dinner was served at 6:30 p. m. and the business meeting followed at 8. Twenty-nine members and guests were present.

President **John S. Houston** and Tri-State Chairman **Kenneth C. Reifsteck** reported the progress to date on the Tri-State Meeting, which will be held in Louisville in the Spring of 1959.

Ed Bruck of the Indianapolis Branch gave us a report on the Interim Meeting held Jan. 11 at Indianapolis.

Three new members were elected.

The meeting was turned over to Librarian Reifsteck who introduced the speaker for the evening, **Elmer Rehme** of Metal & Thermit Corp. Mr. Rehme presented a very interesting paper on the subject of "Crack-Free Chromium Plating". His talk was supplemented with slides and provoked a very worthwhile question and answer session.

Frank E. Wilcher Jr.
Secretary-Treasurer

MILWAUKEE

Murray Addresses Joint Session

The 484th regular meeting was called to order by President **E. H. McCoy** at the Maryland Hotel on Dec. 6, 1957.

Frank Marshall, chairman of the Membership Committee, announced that membership blanks were available for strategic distribution. One new member was elected.

The chair called for a vote on the bylaws changes regarding the election of Delegates. **Eugene Piellusch** moved that the published changes be approved. The motion was seconded, and approved unanimously by the membership.

The chair appointed **Jim Meyers,** sergeant-at-arms. **Glen Schwemmer** and **Paul Beardsley** were appointed co-chairmen of the 1958 Pabst meeting.

Ray Goodsell questioned the membership as to whether they desired to have another outdoor-type Racine Meeting. The response of the membership was in the affirmative.

Mr. Piellusch, educational chairman presented the speaker of the evening, **William K. Murray,** technical service manager for Enthone Inc.

Mr. Murray spoke on "Stripping of Protective Coatings". This was a joint Organic and Inorganic session. A general discussion was presented on the theory behind the stripping of both plated and organic coatings from basis metals without attack of the substrate. Most of the commonly employed metal stripping solutions and methods were discussed and a general review and demonstration of the various type of paint and enamel strippers was presented.

S. Taterzynski
Secretary-Treasurer

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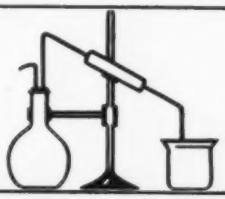

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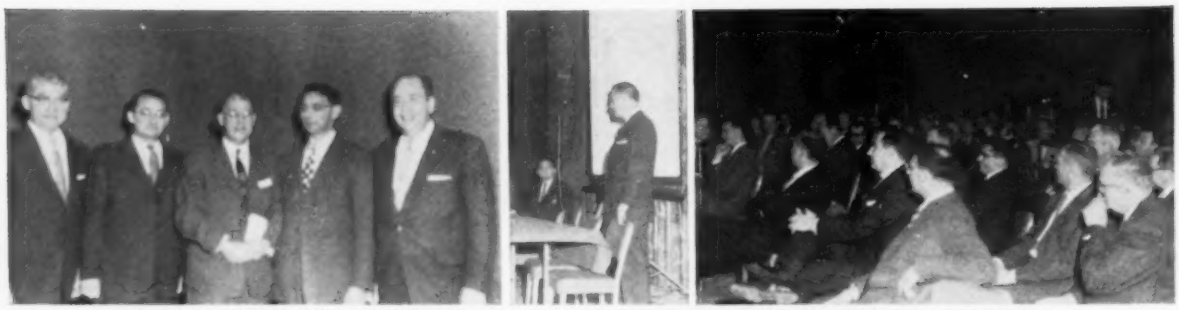

ANNUAL TECHNICAL SESSION OF AES NEW YORK BRANCH, HOTEL STATLER, FEBRUARY 1

(Left) Dais figures, left to right, Dr. Walter R. Meyer, Enthone, Inc.; Dr. Edward B. Saubestre, New York Branch President; Arthur E. Carlson, Program Chairman; Dr. Abner Brenner, National Bureau of Standards; Myron B. Diggin, Hanson-Van Winkle-Munning Company. (Center) National President Francis T. Eddy, greeting the assemblage. Branch President Saubestre is seated. (Right) Part of the room, showing interested members and guests.

NEWARK

Van Tillberg on Copper Anodes

Following the film presentation, "Water, Wealth or Worry", by **Howard Cobb**, President **Grigat** called the business meeting to order. **Don Foulke** reported Grand Rapids' presentation of **Chet Borlet** as a candidate for national third vice president.

Four applications were turned over to the Board of Managers and four Members were elected.

Gus Bittrich reported the Newark Branch Electroplating School all set to start on Feb. 11.

Dr. Wesley reported that the Interim Meeting of the AES held on Jan. 11 at Indianapolis, at which Newark was represented by all three delegates, was worthwhile. He outlined the various action taken, including the 15-month billing to occur in March.

Don Foulke reported for **George Wagner** that the Christmas Party was a financial as well as a social success.

Librarian **Fred Meyer** introduced **Gerald Van Tillberg**, product development engineer of American Metal Climax whose Timely Topic was copper anodes with particular reference to the advantages of OFHC copper anodes.

Louis Donroe then took over in his inimitable manner and conducted his question and answer program, which has become classic both at Newark and New York Branch meetings. Questions ranged from Platers' Putty and polishing compound removal from blind holes to phosphate treatments and leaded copper plating. As usual Louis blithely answered one question wrong and when he asked what it was, **Al Korbelak** beat several others to the punch by a split second to win a bottle of spirits.

The meeting was voted a real success by the seventy attending.

D. Gardner Foulke
Secretary

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NEW YORK

Donroe Conducts Question/Answer Bee

The meeting was called to order Dec. 13, 1957, by the president, **Dr. Edward Saubestre** at the Hotel Statler, New York.

Three applications have been forwarded to the Board of Managers for study.

Two candidates for membership were accepted by The Branch and were duly sworn in by the president.

Joe Rembecki, Banquet Chairman, reported that all his committees are progressing nicely. Joe stated that special efforts are being made with regard to the Ladies Afternoon Session, which should make this event one of the more enjoyable get-togethers for the women.

The president called on the librarian, **Art Carlson,** to present **Louis Donroe,** supervisor, metal finishing, Pyrene Finishing Co., Newark, N. J. Mr. Donroe, better known to us as "Lou", conducted a question and answer bee in the same inimitable manner as he has done in many past years. Everyone enjoyed his visit with us and we are looking forward to the next one. He received a resounding round of applause.

Anthony P. Briganti
Recording Secretary

NEW YORK

Bertuccio on Chrome Plating; Mac Stoker Ill

Dr. Edward Saubestre presided at the Jan. 10 meeting at the Hotel Statler.

It was announced that **Franklyn J. Mac Stoker,** an old timer and truly a servant of the New York Branch and the National Society is gravely ill in a Long Island hospital.

In a report to the membership, Banquet Committee Chairman **Joe Rembecki** covered fully the painstaking plans which have been exerted in an attempt to make this coming banquet a big success. Joe particularly praised **Phil Bruno's** untiring efforts to sell advertising space in the banquet program.

The librarian, **Art Carlson,** introduced **Edward C. Bertuccio** of the Allied Chemical Corp., Baltimore, Maryland. The speaker, in delivering his paper "Industrial Application of Chrome Plating", used three sets of slides and thus very ably described many applications of porous chrome plating. The eloquent Mr. Bertuccio's talk was informative and interesting. Many of his slides were unique. An active discussion period followed at the close of which the speaker received a rising vote of thanks.

Anthony P. Briganti
Recording Secretary

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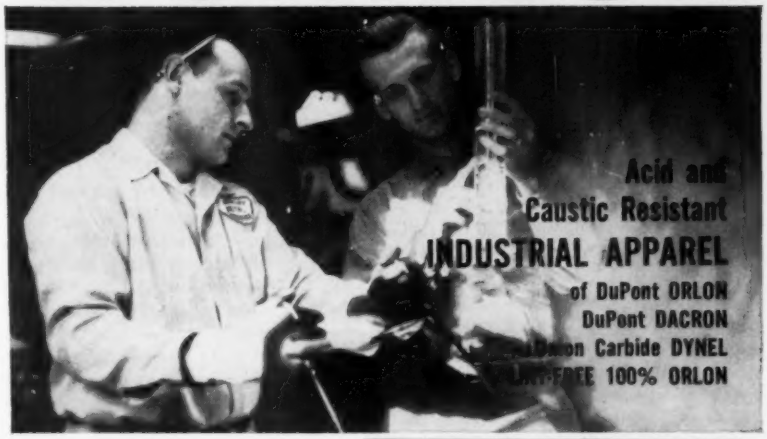

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PHILADELPHIA

Reports Given of Interim Meeting; Stiller Heard on Color Anodizing

The regular meeting at the Engineers' Club on Jan. 27, was attended by 54 at dinner and about 60 at the meeting. After guests were introduced, the minutes of the previous meeting were read and the treasurer's report was heard. Branch President **Farren** gave a report on the Indianapolis Interim Meeting; AES Past President **Heiman** briefly described the Executive Board meetings held before and after the Interim Meeting. He asked for volunteers for national committee work, since only two Branch members were now serving on such committees.

Three applications for membership were received and referred to the Board of Managers. Mr. **Cogan** reported on the AES Membership Committee meeting held in Indianapolis; the various ways and means of increasing membership discussed were presented. Mr. **Zurbach** offered for consideration as a membership inducement, a book similar to the ASM Metals Handbook to be given to new AES members.

Librarian **Hauseman** introduced **Frank P. Stiller,** Sandoz Chemical Co., who spoke on "Coloring of Anodized Aluminum." Mr. Stiller described the alloys most suitable for color anodizing and those that would give trouble. He gave the complete cleaning and anodizing cycle and discussed the critical points. The dyeing and sealing steps were also next given detailed explanation as were the problems and procedures involved in matching dye shades.

I. Wm. Marcovitch
Secretary

ST. LOUIS

Waste Disposal Discussed by Greenberg

The regular monthly dinner meeting was held at the York Hotel, Jan. 8. We had 33 for dinner and 43 for the business meeting that followed. Special guests were **Jack Grady** who represents Larry Goad and Co. in Kansas City, **Richard Loupee** who represents Davies Supply and Mfg. Co. in Kansas City, **Roland Waters, Floyd Gilliam** and **William Ryan** of the local office of Fischer and Porter.

Eugene Conroy reported the tickets for the annual banquet would go on sale Feb. 1, on a first-come first-served basis. The banquet will be held at the Chase Hotel May 17. The date is on the eve of the Cincinnati convention, but efforts to change the date failed.

William Piel reported our membership drive had slowed down, however with a little effort we might earn a membership award given by the National Society.

The meeting was turned over to our librarian who introduced **Larry Greenberg** of Fischer and Porter Co. He gave a very interesting talk, accompanied by flow diagrams, about Waste Disposal. Of particular interest was the integrated waste disposal system for cyanides and chromic acid as developed by **Dr. Leslie Lancey.** Many questions indicated the interest of the group.

Ward W. Kelly
Secretary

SOUTHEASTERN

Gehman on Conversion Coatings

The Southeastern Branch met at the Belmont Steak House, Jan. 10. Final plans were announced for the 3rd Annual Technical Session. **Hugh Gehman,** assistant manager of development, American Chemical Paint Company spoke on "A Discussion of Chemical Conversion Coatings on Metals". Four new members were announced.

Robert H. Probert
Secretary-Treasurer

SPRINGFIELD

Girard Talks on Electroless Nickel

The Springfield Branch met Monday evening, Jan. 27, at Blake's Restaurant. Out of town guests included **J. T. MacDermid** of W. D. MacDermid Chemical Co. of Bristol, Conn. and **Ralph McCahan** of Dupont, Inc., Hartford, Conn. A new member was elected.

Melvin Roske of the Activities Committee explained the finer points of the planned Turkey Shoot which will be held Monday evening, Feb. 3 at the Agawam Sportsmen's Club. Several swell prizes in sight for lucky shooters. Over 40 tickets have already been sold with many more in prospect, as the date approaches. Those who plan the various events are Melvin Roske, **Alexander Salmond, Martin J. Murray, Walter Dyber** and **Elery C. Gibson.**

Roger Heroux reported that one of the Springfield Branch members of long time standing was stricken suddenly, and would be in the hospital for quite some time. The Branch Secretary was instructed to send a token of thought, on behalf of the Branch to **Adalor T. Granger.** The get-well wishes of the entire Branch should bring results.

Librarian Elery C. Gibson introduced the speaker of the evening. A local member and past president of the Springfield Branch, **Robert J. Girard,** electroplating and metal surface treating foreman at the Springfield Armory. Bob

MANUAL AVAILABLE TO BRANCHES

As a reference source to help Branches and Branch officers in effective Branch operation, many dedicated National and Branch leaders collaborated, without any remuneration, in preparing the comprehensive BRANCH OFFICERS MANUAL of the American Electroplaters' Society, embodying practically every conceivable Branch operating subject from membership promotion to Delegates' duties.

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discussed a subject on which he has done much research and experimental work, in the past four years, and on which he holds a patent. "An Evaluation of Various Electroless Nickel Processes" was the subject and the conciseness and completeness of the evaluation was greatly appreciated. The usual question and answer period followed.

Henry L. Heissfeld
Secretary

SYRACUSE

Hard Anodizing Subject of Paper by Sweet

The Jan. 20 meeting was attended by 21 members at dinner and 35 at the meeting that followed. It was held at Turn Hall, the regular meeting place.

The speaker of the evening was **A. W. Sweet** of the General Electric Company, Johnson City, N. Y. His paper, "Hard Anodizing," contained specific information that proved to be of interest and of much practical help.

Refreshments were served later in the evening.

Art Martineau Jr.
First Vice President

WATERBURY

Panel Discussion on Plating and Finishing

The Waterbury Branch held their monthly meeting in the Colonial Room of the Roger Smith Hotel, Thursday, Jan. 9.

Isidore Cross, librarian, arranged a panel discussion for this meeting, panel members were as follows: **Ed Washburn** —Enthone, Inc.; Isidore Cross—Harper Leader; **Jack Hyner**—Whyco Chromium; **William Giesker**—Scovill Mfg., Co. Their subject was "Plating and Finishing Problems".

Ray Mitchell brought new life into the Sustaining Membership Committee. So far this fiscal year, we have added Apothecaries Hall Co., Patent Button Co., and a second membership for Scovill Mfg. Co. **Ted Voyda** lined up Apothecaries Hall, **Frank Tirendi** helped with Patent Button and **Bill Giesker** sold the Closure Division of Scovill. Ray has turned the beam on other new prospects.

Our February Meeting has been designated as Sustaining Members' Night and a special program will highlight our Research Program. At this time we will entertain representatives from our present Sustaining Members as well as representatives from companies who we feel should be more interested in, and better acquainted with, the AES Research Program.

Andrew Perrin, retired for about 10 years from Waterbury Mfg. Co., a Division of Chase Brass & Copper Co., died December 23, 1957. He has been a member of Waterbury Branch for over 27 years and contributed much to the early success of our Branch.

Benjamin H. McGar, in anticipation of his retirement from Chase Brass & Copper Co. in the early part of 1958, has submitted a letter of resignation from Waterbury Branch. He has been a member for over 30 years. Although in recent years his work has not been closely connected with plating and finishing, for many years he contributed generously to the early success and growth of our Branch. His resignation will take effect March 31, 1958. The Branch expresses appreciation for his contributions in the past and extends sincere wishes for a long, happy and rewarding retirement.

Nicholas Topazio
Publicity Director

WICHITA

Schustik Talks on Impurities in Cyanide Solutions

The January meeting was held on the 22nd at the Oriental Cafe in Wichita.

The members and guests were rewarded with a very interesting and factual talk by **Leo Schustik,** of the duPont Chemical Company, who spoke on "The Effects of Impurities in Cyanide Plating Solutions."

The lecture was followed by the showing of a series of slides, and a question and answer period. Our thanks to Mr. Schustik for a very enlightening lecture.

The meeting was adjourned by President **Lawless.**

Estel E. Starr
Secretary

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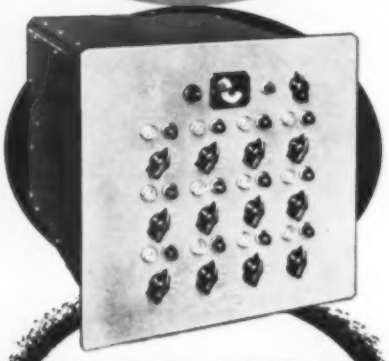

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AES Membership Report

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Blue Ridge: H. Cann, E. O. Eagle, C. R. Hudgins, S. P. Jackson, H. G. Norris, B. E. Wallace
Bridgeport: J. J. Carnicky
Central Michigan: W. P. Devan, M. Hebner
Chicago: V. C. Kitzmiller, D. H. Ross
Cincinnati: E. R. Farmer, C. H. Harmeyer, R. E. Thompson, W. B. Varland
Dayton: I. W. Kendall, M. A. Kiminas, C. Kiser, R. D. Testa
Detroit: G. A. Crittenden, G. DeMirjian, R. DeMirjian, A. D. Estrada, D. W. Knight, R. W. Thomas
Hamilton: E. Gracey, D. Sloan
Hartford: F. L. Lally, D. Nordstrom, K. Routsis, A. Taricani
Indianapolis: W. E. Hilsman, E. Perkins, F. J. Rada Jr., B. F. Rothschild, R. C. Watson, A. L. Wudi
Kansas City: H. D. Burgess, J. H. Jenkins
Louisville: V. L. Baltzell, R. L. Chace, F. Lamping
Milwaukee: B. R. Badeusz
Newark: G. B. Apgar, C. Buch, J. Conrad, Q. Lucarello, J. Wismer
New York: J. Bonifazio, E. Latrento, H. I. Lazaar, E. L. Malone, W. A. Munzer, C. Robinson
Pittsburgh: R. K. Matthews, C. Mungall, J. Presto Jr.
Rochester: D. M. Groh, S. M. Hiscuit
Saginaw Valley: H. J. Baldwin, J. A. Belanger, J. F. Bolton, F. R. Meier, R. Stork
Southeastern: G. W. Asher, J. M. Carter, V. L. Cashen, J. H. La Chapelle, E. J. Kelly, P. Milikin
Southern Tier: E. A. Brewer, T. W. Holton Jr., J. P. Landre, R. B. Wells
Springfield: Q. L. Wolcott
Toronto: T. Dow
Member-at-Large: R. Blinick, Santa Barbara, California; R. A. Shah, Bombay, India

REINSTATEMENTS

Newark: J. J. Shyne

TRANSFERS

Blue Ridge: T. L. Johnson from Baltimore-Washington, W. J. Miller from Philadelphia
Chicago: J. L. Stephens from Philadelphia
Detroit: E. R. Breining to Dayton
Hartford: E. F. Taylor from Grand Rapids
Indianapolis: J. A. Henricks to St. Joseph Valley, F. L. May to Detroit, C. C. Weekly to Los Angeles
Louisville: R. G. Marshall to Philadelphia
New York: J. Melhado to Pittsburgh
Philadelphia: R. G. Marshall from Louisville
Toronto: R. R. Irwin to British Columbia

RESIGNATIONS

Chicago: J. Bouchoux
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SUSPENSIONS

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March 12—**Research Committee Meeting,** Palmer House, Chicago, Ill.

March 15—**Rockford Branch,** Annual Educational Session and Banquet, Faust Hotel, Rockford, Ill.

March 21-22—**Executive Board Meeting,** AES Headquarters, Newark, N. J.

March 28—**Blue Ridge Branch Installation, Roanoke, Va.**

April 12—**Baltimore-Washington Branch,** Annual Banquet, Presentation of the Pot, Park Plaza Hotel, Baltimore, Md.

April 12—**19th Annual New England Regional Meeting and Banquet,** Hotel Statler, Hartford, Conn.

April 12—**Mississippi Valley Branch,** 1st Annual Educational Session and Banquet, Johnny Hartman's Restaurant, Davenport, Iowa.

April 19—**4th Empire State Regional Meeting,** Seneca Hotel, Rochester, N. Y.

May 3—**Boston Branch**—Annual Educational Session and Banquet, Hotel Statler, Boston, Mass.

May 17—**St. Louis Branch,** Annual Banquet, Chase Hotel, St. Louis, Mo.

May 19-22—**45th AES Annual Convention,** Sheraton-Gibson Hotel, Cincinnati, Ohio.

November 1—**Philadelphia Branch,** Annual Educational Session and Banquet, Hotel Sheraton, Philadelphia, Pa.

June 14-18, 1959—**Golden Jubilee Convention and International Exposition, AES,** Detroit, Mich.

July 10-14, 1960—**47th AES Annual Convention,** Hotel Statler, Los Angeles, Calif.

INTERSOCIETY

March 17-21—**National Association of Corrosion Engineers, 14th Annual Conference,** Civic Auditorium, San Francisco, Calif.

March 27-28—**National Association of Metal Finishers,** Educational Committee Meeting, Hot Springs, Va.

April 27-May 1—**The Electrochemical Society, Spring Meeting,** Statler Hotel, New York, N. Y.

May 5-7—**13th Purdue Industrial Waste Conference,** Purdue Memorial Union Building, Purdue University, Lafayette, Ind.

May 18-20—**Metal Finishing Suppliers' Association,** Annual Convention, Sheraton-Gibson Hotel, Cincinnati, Ohio.

May 18-20—**National Association of Metal Finishers,** Annual Convention, Management Seminar and Banquet, Sheraton-Gibson Hotel, Cincinnati, Ohio.

June 9-12—**National Materials Handling Exposition,** and American Society of Mechanical Engineers National Conference on Materials Handling, Public Auditorium, Cleveland, Ohio.

June 14—**Masters' Electro-Plating Association of New York, 40th Annual Banquet,** Hotel Astor, New York, N. Y.

June 22-27—**American Society for Testing Materials,** Annual Meeting and Exhibit, Hotel Statler, Boston, Mass.

November 18-20—**9th National Conference on Standards,** American Standards Association, Hotel Roosevelt, New York, N. Y.

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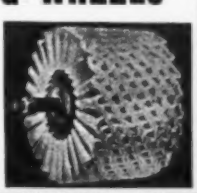

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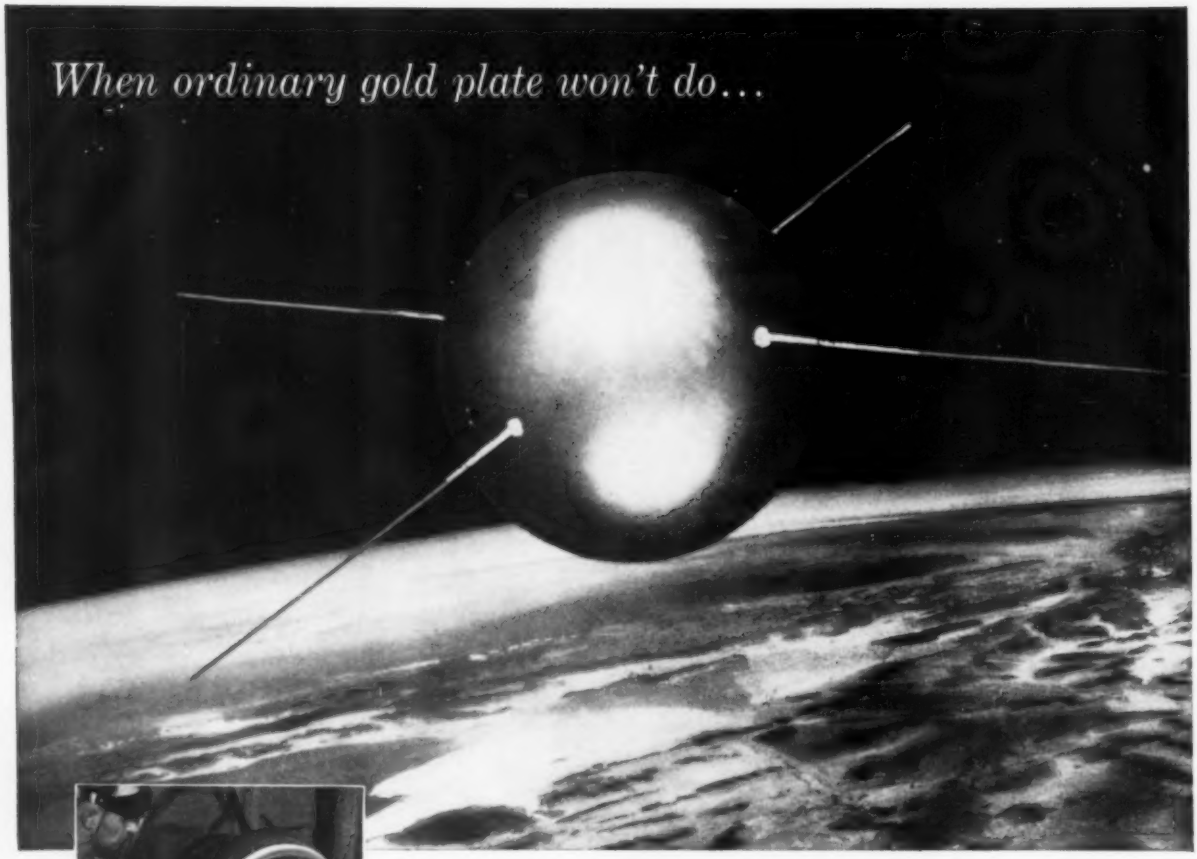

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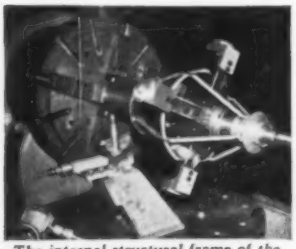

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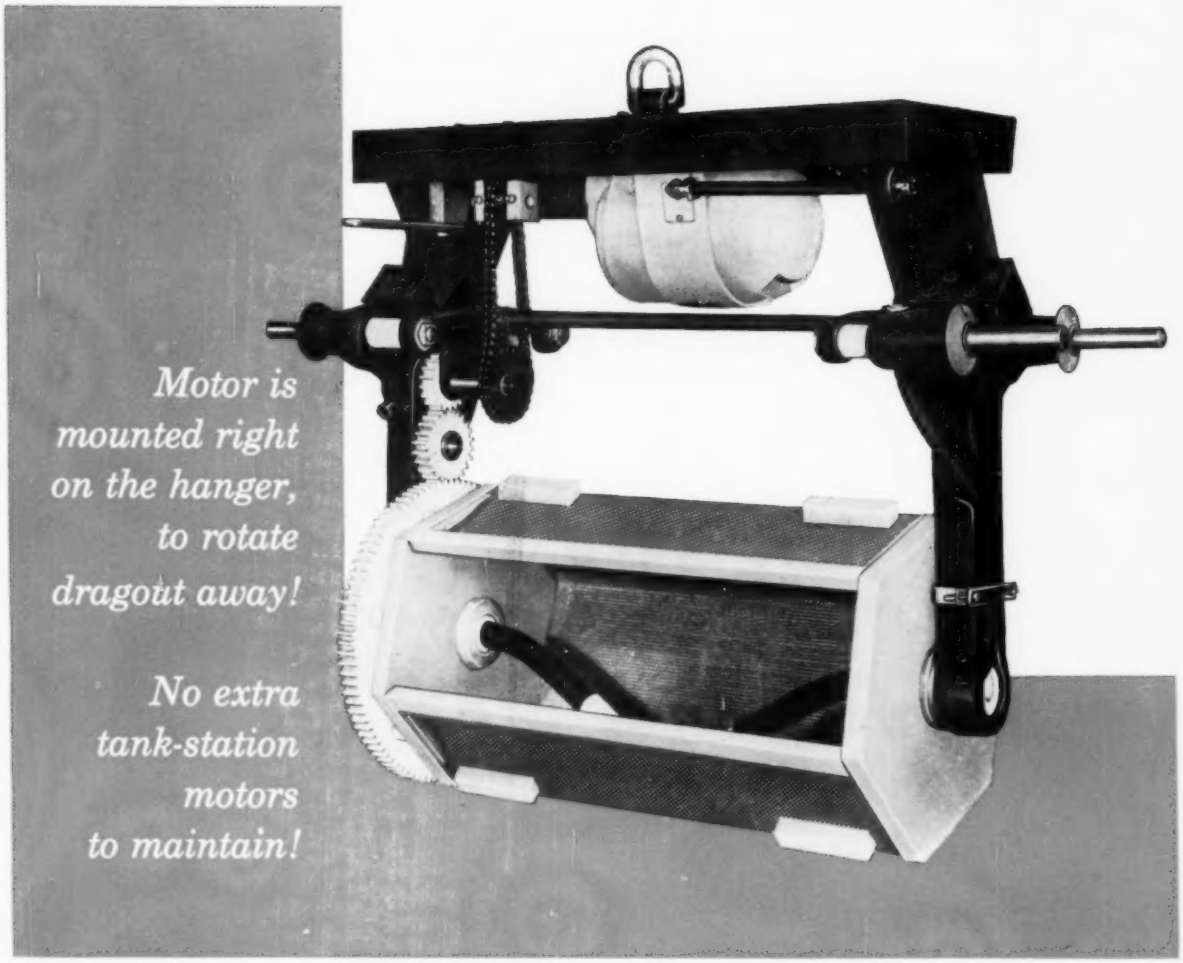

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